How do online conflict disclosures support enforcement?
Evidence from personal financial disclosures and public corruption

ABSTRACT

Public corruption is a concern for democracies around the world. In the U.S., states have responded to this issue by publishing personal financial disclosures (PFD) for public officials online. PFD are a conflict-of-interest disclosure designed to relieve agency conflicts between private citizens and government officials by documenting overlaps between officials' financial interests and public responsibilities. This paper explores whether and how online PFD supports anti-corruption enforcement. I present a stylized model illustrating how online PFD leads investigators to increase case referral volume and quality. Empirically, I find that online PFD for local officials is associated with increased referral rates and greater likelihoods of prosecution conditional on referral. I conduct 126 field interviews of federal prosecutors, journalists, and ethics commissions to understand the mechanisms behind these results. I conclude that online PFD supports the enforcement of local corruption by reducing disclosure acquisition costs for enforcement agents.

Keywords: disclosure, disclosure processing costs, corruption, financial misconduct

I. INTRODUCTION

In 2015 Sheldon Silver, former Speaker of the New York State Assembly, was convicted of corruption after nearly forty years of public service. Silver, who once commanded "viselike" control of the Assembly, used his official role to funnel clients to multiple law firms which shared fees with him. According to the New York Times, Silver "stood out in financial disclosure reports that showed him to be one of the largest earners of outside income among New York State politicians" (Weiser and Craig 2015). In Silver's indictment, prosecutors highlighted his "fraudulent representations and omissions about his outside income" including on his personal financial disclosure (PFD) form.[1] Misrepresentations about his outside income became "focal points of the government's case" against Silver, who was sentenced to 78 months in prison.[2]

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[1] Silver publicly claimed that "his outside legal work was not connected to his official position or to [s]tate government, and that none of his clients had any business before the state" (DOJ 2015, 4-5). Prosecutors discovered that Silver arranged to award state grants to a cancer researcher who directed clients to Silver's firm Weitz & Luxenberg. Silver also got two real estate developers to work with another law firm which shared fees with him (Weiser and Craig 2015).

[2] See Weiser and Craig 2015 and Weiser and McKinley 2020.

Over the past two decades, U.S. states have attempted to manage public corruption by publishing PFD for public officials online. However, states continue to exhibit wide variation in the accessibility of PFD for state and local filers. As of 2017, only 35 states made PFD publicly available online for state-level officials and 17 states offered PFD online for local-level officials.[3] Yet the value of states adopting online PFD to support anti-corruption efforts is nonobvious. On one hand, adopting online PFD ought to make disclosures more available for all readers – members of the public, media, and enforcement agents. On the other hand, online PFD may be superfluous because readers can simply request access to the disclosure (e.g. via FOIA or subpoena).[4]

In this paper, I exploit the staggered adoption of online PFD across states to explore whether and how the medium of public disclosure matters for anti-corruption enforcement. In doing so, I aim to expand the current accounting literature on "disclosure processing costs" by documenting these costs in an enforcement context where government agents seek access to public documents. Recent accounting studies examine processing costs faced by investors seeking information about firms from public firm disclosures (Blankespoor, DeHaan, and Marinovic 2020, Blankespoor, DeHaan, Wertz, and Zhu 2019). They propose that public information – when it is difficult to acquire or integrate into decision-making – can be a form of costly private information. As such, the ways in which public information is disseminated can have meaningful impacts on how that information is used. My study extends this scholarship by exploring whether state governments' online provision of PFD impacts how federal enforcement agents – a key potential user of this information – develop and prosecute corruption referrals.

I execute my study in three stages. First, I propose a stylized model to develop predictions about how online PFD will impact the referral and prosecution of corruption cases. The model

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[3] See Table 1 for an overview.
[4] PFD information should be the same regardless of whether it is accessed online or via request (subpoena, FOIA).

conceptualizes PFD as an information source which can help investigators evaluate a corruption lead. I consider differences between PFD access under an "online disclosure" regime where PFD is publicly available online, and a "request disclosure" regime which imposes investigation frictions on investigators. These frictions represent the disclosure processing costs faced by enforcement agents when they must request access to PFD. One example of these frictions are tipoff costs which investigators incur when they request PFD from the government, which could lead to premature disclosure or information leakage about the investigation. Another example are evidentiary costs, which represent the forgone benefits to investigators of having online PFD accessible to the public and media. By mitigating investigation frictions, online PFD may reduce disclosure processing costs relative to request-disclosure regimes. I also show that online disclosure may be socially optimal compared to request-based regimes if investigation frictions are high and official privacy concerns are low.[5] The model develops two empirical hypotheses: investigators will refer more cases for prosecution under online disclosure (**H1**), and, conditional on referral, online disclosure will lead to a higher probability of prosecution (**H2**). Motivated by prior literature, I explore whether their effects vary across pre-existing monitoring mechanisms (i.e., external monitoring by the media and internal monitoring by the state) (**H3a** and **H3b**).

Second, I test these predictions empirically using data on states which offered online PFD for state and local filers from 2004 to 2017. To understand states' motivations for online PFD adoption, I conduct 33 field interviews of state ethics commissions and PFD oversight bodies.[6] I categorize states as "efficiency-motivated" if they adopted online PFD as part of office upgrade or modernization efforts, and "corruption-motivated" if adoption occurred in response to corruption

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[5] The study does not argue whether online PFD is socially optimal but articulates its possible costs and benefits.
[6] All field research was approved by my institution's Institutional Review Board (IRB 20-0251; IRB 20-1105).

outrage or anti-corruption legislation.[7] To mitigate concerns that alleged corruption outcomes may be driven by contemporaneous corruption concerns or legislation, I limit my analyses to efficiency-motivated adopters. I also consider the effects of online PFD for local official filers as opposed to state official filers. Ex ante, I expect that the effect of online PFD for local filers on local corruption ought to be more pronounced than that for state filers on state corruption. The paper studies PFD which are managed and made available online by the state (e.g., state ethics commissions). As a result, state officials are likely to have more control over PFD rules and accessibility than their local counterparts. This would allow state officials greater capacity to obscure PFD information they do not wish to reveal, making the disclosures potentially less useful for enforcement agents and diminishing the effect of online PFD on state corruption. In contrast, local officials likely wield less authority to tailor PFD rules to suit their preferences, making online PFD more helpful for detecting misconduct by local officials. Nevertheless, I use both settings to test the impact of online PFD adoption on two measures of alleged corruption: (1) referral rate and (2) prosecution rate.

Consistent with my hypotheses, I find that online PFD for local filers is associated with increased referral and prosecution rates for local corruption. Using a matched sample of federal districts, I estimate that local online PFD raises the number of referrals detected in the median district-year from 3 to 7.7 – an over twofold increase in referral volume. Local online PFD is also associated with an increase in the prosecution rate by .18, raising the median district-year prosecution rate from 33 percent to 51 percent. These results are robust to falsification tests using placebo treatment years and placebo outcome variables defined at the federal (rather than state or local) corruption level. I also observe that the main effects for **H1** (referral rate) do not appear concentrated in high or low monitoring districts, whereas **H2** (prosecution rate) appears

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[7] This methodology follows the narrative approach pioneered by Romer and Romer 2010 and Giroud and Rauh 2019 in the tax literature to address endogeneity concerns linked to policy changes. See discussion in Section IV.

concentrated in districts with high internal monitoring (state ethics budget per employee). While this suggests that online PFD may complement existing state investments in government oversight (**H3**), these tests are not conclusive as I do not detect significant differences between subgroups.

In addition, I find that these results do not extend to state filers. This follows my initial prediction that state officials may tailor PFD rules to suit their needs, and potentially obscure useful information for enforcement agents. I discuss this hypothesis in detail in Section VI and provide two empirical examples of this phenomenon. I also observe that the sample volume of local corruption referrals and prosecutions is almost three times higher than that of state corruption. This feature of the data may also contribute to the lack of results for state filers.

Third and finally, to understand the real-world mechanisms behind these results I conduct an additional 93 interviews of current and former federal prosecutors and journalists. Overall, I learn that prosecutors see PFD as having both investigative and evidentiary value. As an investigative tool, PFD can help provide links to other evidence and third-party organizations (i.e., non-profits, private firms, etc.) while giving an early-stage picture of an official's self-reported assets. As evidence, PFD – and omissions on PFD – can be crucial for establishing consciousness of guilt in obscuring illicit transactions. Respondents felt online PFD would likely increase corruption leads by enhancing public access to information about officials' financial conflicts. For investigators, an online system where PFD can be reviewed anonymously can also prevent premature disclosure about the investigation (Appendix D). Thus, online PFD may support anti-corruption enforcement by (1) helping investigators run efficient and covert investigations and (2) increasing public access to information on financial conflicts which supports lead development.

I contextualize these findings within the disclosure processing costs literature which identifies three types of processing costs – acquisition, integration, and awareness (Blankespoor et

al. 2020, Blankespoor et al. 2019). I consider these costs in the context of federal enforcement agents (investigators and prosecutors) using PFD to develop corruption referrals for state and local officials. These costs to the agents include: (1) acquisition costs from acquiring and extracting usable information from PFD, (2) integration costs from combining PFD information with other signals to make corruption referral and prosecution decisions, and (3) awareness costs from becoming aware that PFD exist. My analyses suggest that online PFD primarily supports enforcement by reducing acquisition costs for enforcement agents. Specifically, online PFD enables agents to obtain the disclosures through a more direct and discrete channel than formally requesting PFD from the state.[8] As a secondary effect, online PFD may further reduce agents' integration costs by enhancing public and media access to information about officials' finances. Public access to PFD content and having more "eyes on the ground" can enable agents to better integrate PFD information into their referral-decision process. Finally, online PFD does not appear to impact awareness costs, as most journalists and prosecutors appear to be aware of the existence of PFD (Appendix D, A-Q4 and B-Q2).

This work contributes to the literature on disclosure and financial fraud, while responding to practitioner demand for greater understanding of PFD as an anti-corruption tool. Prior accounting and political economy studies suggest the importance of transparency for monitoring firms, governments, and public officials (Leuz and Wysocki 2016, Healy and Palepu, 2001, Amiram et al. 2018, Cordis and Warren 2014). The current paper illustrates that *how* officials' PFD are made publicly accessible can help enforcement agencies do their jobs by reducing disclosure acquisition costs. Online disclosure can support enforcement activity (i.e., referring and

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[8] This paper focuses on the medium of PFD availability (i.e. online versus not online). Within online PFD, I do not distinguish between different ways information can be available online (ex. searchable data fields). My claims about acquisition costs relate to lowering the cost of accessing PFD rather than extracting data from a given disclosure.

prosecuting corruption cases) by enhancing disclosure access for agents, the public, and media, and even protecting covert investigations (e.g., avoiding tipoffs to investigation targets or the public). To the best of my knowledge, my paper is the first to use large-sample field evidence to document these channels in the context of financial crime enforcement in the U.S. In that regard, the study contributes to prior literature not just by showing that public disclosures can support enforcement activity, but also by documenting the likely mechanisms through which public disclosures can support enforcement activity.[9]

My paper also responds to practitioner demand for better understanding PFD's role in anti-corruption enforcement. The International Monetary Fund's 2020 Anti-Corruption Challenge solicited proposals on how to implement better financial disclosure systems for public officials. The challenge asserted that disclosures "have the potential of being a valuable instrument throughout the anti-corruption value chain as well as […] anti-money laundering and asset recovery." As such, "the potential uses of financial disclosure information deserves greater attention" (IMF 2019). Other international financial institutions appear to share this view. The World Bank's 2012 book on income and asset disclosure (IAD) claimed that official financial disclosures "can generate a valuable source of information for financial or corruption investigations." Yet understanding the role of IAD systems in supporting financial investigations and prosecutions remains "as yet largely untapped" (Haberschon and Trapnell 2012, 1). While few political sciences, journalism, and practitioner publications have studied asset disclosure

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[9] The idea that reducing processing costs for public disclosures can benefit regulators extends beyond the anti-corruption setting. For example, recent work by Larcker, Lynch, Quinn, Tayan, and Taylor 2021 examines the SEC requirement that corporate executives disclose plans to sell restricted stock (Form 144) to prevent executives from making personal trades based on nonpublic information. "Strangely," the authors note, "the SEC does not require electronic submission of Form 144 and continues to allow such forms to be mail-filed." Most disclosures are filed on paper, only to be retained in SEC offices and destroyed after ninety days. As a result, comprehensive data on these disclosures "is not widely available to either the public or to the Commission [SEC]" (1). My study would suggest that moving to online filing may also facilitate enforcement activity around insider trading.

requirements, I believe this study is the first to respond to these calls by exploring the impacts of online PFD.

Lastly, this paper highlights personal financial disclosures and disclosure policy as a ripe and underutilized setting for exploring questions about disclosure and enforcement.[10] Working within state or local government does not always constitute full-time work, opening opportunities for officials to receive outside income which could create conflicts of interest. For example, working in the state legislature does not qualify as full-time employment in forty out of fifty states (NCSL 2017). The Center for Public Integrity found that 76 percent of state legislators reported outside income on their 2015 PFDs (White 2017). Anecdotal evidence further suggests public officials are aware of the disclosure's importance – especially in the context of criminal cases.[11]

II. INSTITUTIONAL BACKGROUND AND PRIOR LITERATURE

This paper uses anti-corruption enforcement as a vehicle to explore how disclosure accessibility can support enforcement activity. I first provide institutional background on the setting and then summarize previous work on disclosure and corruption.

In the U.S., most public corruption cases are handled by federal enforcement agencies. This includes alleged corruption by public officials working at the state and local government level.[12] Federal investigators (e.g., FBI) and prosecutors from U.S. Attorney Offices (USAO) work together to prosecute public corruption cases on behalf of the Department of Justice (DOJ). Investigative agencies learn about potential corruption through leads driven by internal inquiries

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[10] For example, Tahoun and Van Lent 2019 use these disclosures to show how officials' investments impact voting.
[11] A New York defense lawyer testified to advising state representatives to hand-deliver their financial disclosure forms to avoid mail fraud charges. The federal judge described the admission as "extraordinary" (Neil 2009).
[12] Cordis and Milyo 2016 estimate that up to 94 percent of public corruption cases from 1986 to 2014 were ultimately handled by federal rather than state and local prosecutors (130). Most federal corruption cases also originate from referrals made by federal investigators rather than state or local authorities. Based on TRAC data from 1986 to 2017, the FBI originated approximately 75, 76, and 28 percent of state, local, and federal corruption cases respectively (by comparison, state and local authorities originated roughly 5, 4, and 1 percent of state, local, and federal cases).

or external monitors (i.e., whistleblowers, media, etc.) Based on these tips, investigators conduct investigations to determine whether the cases could be successfully prosecuted in court. Once the investigative agency decides to move forward with a case, it will issue a referral to the USAO in its federal district. If the referral offers a promising path to prosecution, the USAO will file and prosecute the case. State governments serve as custodians for many public records, like PFD, which can be useful to enforcement agents. This paper explores whether publishing PFD for state and local filers online impacts case referral and prosecution rates by federal enforcement agents.

Previous accounting scholars have used a variety of settings to study how the medium of disclosure impacts the ways in which readers react to and use disclosure information. For example, Duro, Heese, and Ormazabal 2019 find that the online release of comment letters from the SEC leads to increased capital-market responses to firm financial reporting. Similarly, Christensen, Floyd, Liu, and Maffett 2017 find that secondary disclosure of mine safety records in mining firms' financial disclosures decreases real mine-related safety issues. In two separate but related studies, Blankespoor 2019 and Blankespoor, DeHaan, and Zhu 2018 find that increased digital salience of firm-level information (through XBRL disclosure tagging and robo-journalism) can enhance the dissemination of firm information in capital markets. Through this work, researchers have documented the existence of "disclosure processing costs" which arise when readers invest effort into extracting information from disclosures – even when disclosures are publicly available.

I seek to broaden the existing scholarship on disclosure processing costs by considering the enforcement effects of reducing such costs for public officials' PFD. Public corruption is a threat to governments and markets around the world (Shleifer and Vishny 1993), and prior studies document firms' long history of leveraging political relationships for economic benefits (Faccio 2006, Goldman, Rocholl, and So 2013, Christensen, Mikhail, Walther, and Wellman 2017, Mehta,

Srinivasan, and Zhao 2020). Official financial disclosures offer enforcement agents a tool to monitor misconduct. How might PFD accessibility support agents in their role to refer and prosecute corruption cases?

Research specifically on official financial disclosures as an anti-corruption tool remain scant and generalized. Djankov, La Porta, Lopez-de-Silanes and Schleifer 2010 find that countries where parliament members' financial disclosures are public tend to have higher government quality and lower corruption. Wihbey and Beudet 2016 develop a disclosure measurement score based on state governors' 2015 PFD, but do not find significant correlations between their measure and public corruption. Szakonyi 2018 finds that Russian cities which adopted PFD requirements saw fewer incumbents seeking re-election. Separately, institutions such as the World Bank have published practitioner guides for designing financial disclosure systems for public officials (Habershon and Trapnell 2012).

Perhaps the most closely related paper to the present work is Cordis and Warren 2014, which develops an index for state FOIA laws and finds that corruption decreases after states move from weak to strong-FOIA regimes. However, this study differs from Cordis and Warren in several important ways. First, the research questions are distinct. Cordis and Warren ask whether increased governmental transparency will reduce corruption among state and local officials. In contrast, I ask how the ways PFD are made publicly available (i.e., online PFD) impact federal agents' internal enforcement processes (i.e., making and prosecuting corruption referrals). Stronger FOIA regimes may enable readers to access more information that supports decision-making, but *how* this information is offered may also shape the readers' ability to process this information. Establishing that online PFD supports agents' investigative process is again nonobvious – online PFD may be redundant if investigators can already access disclosures (e.g., FOIA, subpoena).

Second, the channels through which transparency supports enforcement differ across the two studies. In the PFD setting, access to disclosures is driven by the supply side (state) by making disclosures publicly accessible online. In the FOIA setting, access to disclosures is driven instead by the demand side (public) who must request specific records of which they were already aware.[13]

Finally, I believe this paper is also the first to use field evidence to document potential mechanisms linking disclosure transparency (via online PFD) to changes in corruption enforcement activity. While previous papers use archival data to suggest potential mechanisms (e.g., that the media helps propagate disclosure information), this study supports such mechanisms – and proposes new ones – by engaging directly with journalists and federal prosecutors.

III. HYPOTHESIS DEVELOPMENT

To develop hypotheses around how online PFD may help investigators evaluate corruption leads for prosecution, I propose the following stylized model. I provide intuition and predictions in this section, with the full model available in Appendix A.

In practice, federal investigators and prosecutors collaborate to bring public corruption cases on behalf of the DOJ. Investigators filter through case leads and refer certain leads to prosecutors for prosecution. When deciding whether or not to make a referral, investigators weigh the potential benefit from referring leads which successfully result in prosecution—i.e., high-quality leads—against the potential cost from referring leads which prosecutors discard—i.e., low-quality leads. I propose that investigators may seek additional information about the quality of a

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[13] The identification strategies and outcome variables between these papers are also different. Cordis and Warren's FOIA index is based on four measures (state liability for violations, request response time limits, document access fees, and discretion to deny requests) (23) which do not include a measure for the medium of disclosure. Cordis and Warren also use corruption convictions data to study changes in real corrupt activity and detection rates. I instead examine how state office-level choices to offer PFD in another format (online) shape enforcement agents' referral and prosecution behavior which occurs before the court system determines the cases' final outcomes.

lead via PFD, which represents the probability that prosecutors will prosecute the lead after referral. PFD can thus inform the investigator's referral decision.

I consider two alternative information regimes by which a social planner can make PFD available to investigators. First, the social planner can decide to make PFD *publicly observable* online ("online disclosure") which imposes an official privacy cost on society.[14] Second, the social planner can make PFD *privately observable* to the investigator through a formal request or subpoena ("request disclosure"). However, request disclosure imposes investigation frictions which reduce the probability that a given lead will result in prosecution. One example of such frictions are tipoff costs, whereby investigators compromise the secrecy of their investigation by formally requesting PFD from the government. Tipping off an official that they are being investigated can undermine an investigation by allowing that official to try to thwart the investigation (i.e., obfuscate evidence, hire a lawyer, etc.) Another example of investigation frictions under request disclosure are evidentiary costs, whereby investigators forfeit additional support of the public and media in generating quality referrals. Put differently, these costs represent the forgone benefits to investigators of having online PFD accessible to the public and media for developing leads and collecting evidence.[15] These investigation frictions may reduce a referral's attractiveness for prosecution under request disclosure.

I begin by observing that which regime is socially optimal will depend on the relative magnitude of investigation frictions incurred by investigators and privacy costs borne by society. More precisely, I anticipate that online disclosure is likely to be socially optimal when

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[14] This is consistent with prosecutors' view that privacy is a top concern for online PFD (Appendix D, A-Q4).
[15] Tip-off costs and evidentiary costs also reflect real-world costs facing investigators and prosecutors, who are resource constrained. Prosecutors report that PFD are most helpful for connecting pieces of evidence to build a convincing case for prosecution, especially early in an investigation (Appendix D, A-Q2). Among the potential benefits of online PFD, they cite promoting covert investigations and enhancing the public and media's access to PFD (Appendix D, A-Q4).

investigation frictions are relatively high and privacy costs are relatively low. Given these features, how might investigators' referral behavior differ between request and online disclosure regimes?

First, under request disclosure, investigators incur investigation frictions (e.g., evidentiary costs, tipoff costs) when requesting PFD. These frictions *lower* the probability that a lead can be successfully prosecuted by the USAO. Given that investigators only want to refer leads to the USAO that have a sufficiently high probability of being prosecuted, investigators will only refer leads that have high enough quality to compensate for investigative frictions. Thus, investigative frictions will *raise* the threshold for the quality of leads that investigators will want to refer for prosecution. Because the threshold for referring leads is lower under the online disclosure regime than the request disclosure regime, referral volume ought to be higher under online disclosure than request disclosure (**H1**). Second, leads referred under online disclosure ought to have a higher probability of prosecution than those referred under the request disclosure regime (**H2**). Why should this occur? Investigators may refer more leads under online disclosure than request disclosure, but it is not obvious that – conditional on referral – these leads will have a higher probability of prosecution. Under request disclosure, investigators refer fewer and higher quality leads, however they also incur investigation frictions which lower the overall probability of prosecution. Although the quality of leads at the optimal referral threshold is higher under request disclosure than under online disclosure, this does not fully compensate for the investigation frictions.[16] Thus, referrals under online disclosure are expected to have a higher probability of prosecution compared to referrals under request disclosure.

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[16] Consider the tradeoffs of the investigator under request disclosure. Investigation frictions push the investigator's referral threshold upward, so they become pickier about which leads to refer. However, as the threshold for referral increases, investigators refer fewer cases and thus realize fewer benefits from referring high-quality leads. The investigator must balance their "pickiness" with their desire to refer high-quality leads. The tradeoff leads the investigator to make referrals with lower expected prosecution probability under request rather than online disclosure.

Finally, and separately from the model, I introduce **H3a** and **H3b** to test whether the main effects from H1 and H2 differ based on the strength of external or internal monitoring. H3a predicts that online PFD serves as a complement to external monitoring (local newspaper circulation). This is motivated by prior research suggesting that local media is a powerful information intermediary which can help monitor firms and governments (Gao, Lee, and Murphy 2020). H3b is a two-sided hypothesis exploring whether online PFD complements or substitutes for internal monitoring of public officials (state ethics commission budget per public employee). States which invest in ethics oversight may have stronger systems for PFD administration and monitoring and be more capable of supporting federal investigations. Alternately, online PFD could substitute for internal monitoring if federal investigators have limited resources for learning about officials' finances.[17]

Through its empirical tests, this paper addresses how referral and prosecutorial behavior changes in response to states shifting from request to online disclosure regimes by adopting online PFD. However, this paper is unable to answer whether online PFD is socially optimal, as quantifying privacy costs and investigation frictions lies beyond its current scope.

IV. DATA AND METHODOLOGY

To test these hypotheses empirically, I collect data on the treatment variable (online PFD), outcome variables (alleged corruption), and proxies for external and internal monitoring (media coverage and ethics budget). While treatment is defined at the state level (e.g., states adopt online PFD for local and/or state filers), analyses are performed at the federal district level. There are 94 federal districts representing all U.S. states and territories, with at least one district in each state (DOJ 2017b). The unit of observation for all analyses are federal district-years.

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[17] Prior literature does not appear to provide strong evidence in either direction. For example, Crider and Milyo 2013 do not find a significant relationship between state ethics commissions and reductions in public corruption.

Defining the Treatment: Online PFD

I begin by constructing an original dataset of state-level PFD policies, including which states offer online PFD and the earliest dates when online PFD became available. I obtain an initial listing of state code sections on financial disclosure requirements from the National Council of State Legislators (NCSL 2019). I read state codes available in Westlaw and NexisUni to verify code sections pertaining to state and/or local officials and record the codes' earliest citation dates. I categorize states as having PFD requirements for state officials and local officials using the following decision rules. I define "state officials" as any official employed by and/or servicing a state agency. This includes positions such as state legislator, state judge, governor and executive branch official, and state employee. "Local officials" refer to any official employed by and/or servicing a sub-geography of the state. This includes municipal officials and employees, district or county officials and employees including local judges.[18]

Next, I identify which states make PFD available online and the earliest date when PFD was publicly accessible online using state websites and the Wayback Machine Internet Archive.[19] I also confirm whether this date differed for disclosures related to state officials and/or local officials. See Appendix B for PFD web-links, classification, and online PFD dates.

Finally, I conduct field interviews of state offices which offer online PFD to understand the motivations behind online PFD adoption. A key identification concern in this paper is that online PFD may be adopted in conjunction with other anti-corruption policies, or in response to recent corruption scandals.[20] This raises endogeneity concerns for identifying the effect of online PFD on alleged corruption. To address this issue, I classify states into "efficiency-motivated

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[18] For details, see Appendix C. A complete listing of positions covered and code sections is available upon request.
[19] If a representative from the state ethics commission offered an online disclosure date which differed from the Wayback Machine date, I deferred to the date offered by the ethics commission.
[20] This issue is common to corruption studies, see Cordis and Warren 2014 and Crider and Milyo 2013 for examples.

adopters" (i.e., adopted online PFD to modernize their workflow) and "corruption-motivated adopters" (i.e., adopted online PFD as part of a larger anti-corruption program). This methodology follows the narrative approach employed in recent tax literature for disentangling state policies (i.e., tax changes) motivated by "plausibly exogenous" long-term versus "plausibly endogenous" short-term economic concerns (Romer and Romer 2010, Giroud and Rauh 2019).[21] Nevertheless, one potential drawback is that interviews or news articles may overlook other contemporaneous changes (i.e., to PFD systems) which could affect the observed outcomes. This concern must be considered when interpreting results using this classification methodology.

I interviewed 33 offices in total, representing 94 percent of the states which made PFD available online as of 2017.[22] Table 1 summarizes the final classification, and Appendix C details the classification procedure. I classify "efficiency-motivated" PFD adopters as states whose offices adopted online PFD due to efficiency rather than corruption motivations. Efficiency motivations include convenience and modernization, desire to model transparency, and cost savings. Corruption motivations include comprehensive ethics reform, wide-ranging amendment to existing laws, and recent corruption scandals. I define treated federal districts as districts in states with PFD requirements which adopted online PFD for efficiency-motivated reasons.[23]

Defining the Outcome: Alleged Corruption

This paper considers public corruption to be corrupt acts performed by public officials. The aggregated TRAC public corruption data measures corruption charges for DOJ-defined programs

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[21] Giroud and Rauh 2019 gather motivations for tax changes from news articles surrounding tax changes and classify these motivations into endogenous versus exogenous categories (1285). This approach also responds to calls to incorporate field data into archival research, especially to gauge the motivations behind policy changes (Soltes 2014).
[22] Most often this was the state ethics commission, and occasionally a sub-division of the secretary of state's office.
[23] I validate my classification by conducting a search for news mentions of public corruption within three years leading up to online PFD adoption. I plot the trends of media mentions across time as a proxy for the level of detected public corruption within the state. I use Factiva and NexisUni to search national and local newspapers for the term "public" within ten words of terms related to bribery, conspiracy, embezzlement, fraud, kickbacks, misappropriation, corruption, and scandal and within 100 words of the state name (Cordis and Milyo 2016). See Figure 1.

for "state corruption" and "local corruption" from 1986 to 2017.[24] The TRAC referral-level data, based on USAO administrative records, provide a strong basis to explore the impacts of online PFD across multiple stages of this process. The data show, at the federal district and DOJ corruption program level, the full population of corruption referrals from investigative agencies and whether referrals resulted in prosecution or disposal. These data span 2004 to 2017 and serve as the basis for my measures of alleged corruption. I consider two outcome variables: (1) referral rate (volume of detected referrals per ten thousand government employees) and (2) prosecution rate (proportion of referrals selected for prosecution).[25]

Defining the Monitoring Environment: Internal and External PFD Oversight

To proxy for internal monitoring by the state, I use the annual state ethics commission budget scaled by the number of full-time equivalent government employees. This variable is drawn from the Council on Governmental Ethics Laws (COGEL) Blue Book series which provides rich qualitative information on the resources and financial disclosure practices of each ethics commission from 2008 to 2018. I use the commission's budget per employee as an umbrella measure to capture the level of states' investment in ethics oversight. I posit that states which allocate more resources this office likely have stronger systems for PFD administration and monitoring.[26] To proxy for external monitoring, I use the Editor and Publisher Newspaper Databook which provides counts of newspaper circulation at the city-year level.[27] I aggregate

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[24] The three most frequent charges for both state and local corruption were: "theft or bribery concerning programs receiving federal funds" (18 USC 666), Hobbs Act (18 USC 1951), and "mail fraud" (18 USC 1341). (The Hobbs Act is a provision of the federal extortion statute (DiBiagio 2020) and is one of the three main legal provisions supporting public corruption.) The charges account for half (53 percent) of sample state and local corruption cases.
[25] The TRAC referrals data consist of all records available from USAO offices from 2004 to 2017. I require that treated districts adopt online PFD between 2007 and 2014 to observe three years before and after adoption (Table 1). For untreated districts (no online PFD adoption), I restrict all district-years to be between 2004 and 2017 inclusive.
[26] Since the data sample begins in 2004, COGEL respondent values from 2008 are carried back to the sample start. States which did not participate in COGEL are excluded from sub-sample analyses based on COGEL survey variables.
[27] These data range from 2004-2016, with values carried forward for the final sample year.

this figure to the federal district-year level, and scale by the population in each district-year.

Additional Control Variables

Following prior literature, I include control variables for economic conditions (income and legal expenditures per capita, as well as unemployment, high school attainment, and internet access rates) drawn from the U.S. Census, Bureau of Economic Analysis, and National Telecommunications and Information Administration. These variables attempt to capture the level of economic prosperity in a federal district, as well as the amount the state has chosen to invest in law enforcement and education (Glaeser and Saks 2006, Cordis and Warren 2014). To control for political factors associated with e-government adoption, I also include indicators for the political party in control of the state legislature (McNeal, Tolbert, Mossberger, and Dotterweich 2003, McNeal and Hale 2010).

V. EMPIRICAL MODEL

To test the impact of online PFD on corruption, I estimate the generalized difference-in-differences model given below in Equation (1). States adopted the treatment (online PFD) in a staggered fashion, meaning that not all states received treatment at the same point in time. Staggered adoption helps mitigate concerns that results are driven by concurrent institutional or economic changes which are unrelated to online PFD adoption.

$$Y_{i,s,l,t} = \alpha + \beta * \text{online\_PFD\_x\_post}_{s,l,t} + \theta * \text{Ext}_{i,s,t} + \delta * \text{Int}_{s,t} \qquad \text{(Eq. 1)}$$
$$+ \lambda * X_{i,s,t} + \gamma_t + \rho_{i,s} + \varepsilon_{i,s,l,t}$$

In Equation (1), i indexes the federal districts located within state s at year t. The dependent variable $Y_{i,s,l,t}$ is one of the public corruption outcome measures in district i, state s, year t, for the DOJ public corruption program l. The DOJ classifies public corruption referrals into categories for "federal," "state," and "local" corruption. The paper considers two district-level outcome measures: (1) volume of corruption referrals scaled by full-time equivalent state and local

government employees (tens of thousands) ("referral_rate") and (2) proportion of referrals selected for prosecution ("prosecution_rate"). All variable descriptions are summarized in Table 2.

The main treatment variable of interest is online_PFD_x_post$_{s,l,t}$ which equals one from the year after state s has made PFD available online for officials in program level l. Put differently, if state s adopts online PFD for program level l in year t, then the treatment indicator online_PFD_x_post$_{s,l,t}$ equals one in the three years after online PFD adoption (t+1 to t+3) and zero in the preceding years (t-3 to t). This coding is illustrated in Figure 2. Ext$_{i,s,t}$ represents the level of external monitoring of public officials at the federal district level. The proxy measure for external monitoring is the average daily newspaper circulation per capita ("news_circ") in district i, state s and year t. Int$_{s,t}$ represents state-provided internal monitoring of public officials, and is proxied by the state ethics commission budget scaled by government employees in state s and year t ("ethics_budget"). X$_{i,s,t}$ is a vector of economic and political control variables defined at the federal district level (income per capita, unemployment) and state level (legal expenditures, educational attainment, internet access, legislature majority). I include fixed effects for all years γ_t and districts $\rho_{i,s}$ and cluster standard errors at the state level.

VI. RESULTS

I begin with a full sample of treated federal districts and untreated federal districts. Treated districts belong to efficiency-motivated online PFD adopter states, and untreated districts belong to states which did not adopt online PFD over the sample period (2004-2017). I exclude districts from states with corruption-motivated adoption to avoid misattributing corruption outcomes to online PFD as opposed to another concurrent anti-corruption policy.

I observe that, while all adopters made online PFD available for state official filers, a subset of adopters also offered online PFD for local official filers. I refer to the former group as the "state

adopter group" and the latter the "local adopter group." The TRAC data break out alleged corruption measures across federal, state, and local corruption programs, allowing me to distinguish between the impact of online PFD for state filers on state corruption ("state adopter group"), and for local filers on local corruption ("local adopter group") (see Table 1).

Between these groups, I expect the effects of online PFD to be more pronounced for local filers. Recall, the PFD studied in this paper are made available by the state as opposed to local authorities. Therefore, I expect that state officials would be better able to adapt PFD to suit their needs (i.e., obscure unfavorable financial conflicts). In contrast, local officials wield less authority to tailor PFD rules according to their own preferences. Thus, online PFD may be more helpful for enforcement agents seeking to detect misconduct by local officials.

Local Adopter Group

I begin with the local adopter group to assess the effects of local online PFD on local corruption. I apply coarsened exact matching (CEM) supplemented by hand-matching to generate a sample of treated and control districts for analysis.[28] I define treated districts as belonging to efficiency-motivated states which adopted local online PFD. Control districts belong to states which either: (1) never adopted local online PFD or (2) adopted local online PFD more than three years after the latest treated district. To perform the match, CEM temporarily coarsens continuous variables for control units and assigns them to strata featuring common values. One feature of this algorithm is that it prunes units from any stratum that does not contain at least one treated and control unit. To avoid pruning treated districts from the small treatment sample, I supplement CEM-generated matches with hand-matches. In total, I match on three variables (median income

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[28] Matching in small samples is meant to improve balance along key covariates and reduce bias in treatment effect estimates (Blackwell, Iacus, King, and Porro 2020). Local adopters have ample controls (n=58) to match to treated districts (n=12).

per capita, political party, and region) for control selection in the CEM-generated sample and two variables (median income per capita and political party) for the supplemental hand-matches.[29]

CEM, like other exact matching techniques, imposes dimensionality constraints which limit the researcher's ability to match treated units to controls based on precise pre-treatment covariate values. To address this issue, I identify key matching covariates based on prior literature. Studies suggest that state wealth and political party leadership are associated with public corruption and e-government adoption. I select income per capita as my proxy measure for district wealth because it is likely to correlate with important economic indicators linked to corruption such as educational attainment or unemployment (Glaeser and Saks 2006, Tolbert, Mossberger, and McNeal 2008). To capture political and cultural attitudes towards e-government and corruption, I select controls with the same political majority in the state legislature and geographic region.[30] Table 3 presents the final matches (Panel A) and summary statistics (Panel B).[31]

I estimate Equation (1) in the matched sample and find that local online PFD is associated with increased referral rates, in support of **H1**. Table 4 reports results from multiple estimations of Equation (1) with sequentially robust specifications, building from reduced specifications in Columns (1) and (2) towards the main model in Column (3). Column (1) estimates a basic differences-in-differences model absent fixed effects and controls. The estimate of the treatment effect – coefficient on "online_PFD_x_post" – is significant at the 5 percent level. The coefficients on "online_PFD" and "post" are insignificant which is also meaningful in this context. First, the insignificance of "post" indicates there were no significant changes in referral rates in the control

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[29] The results are robust to using alternate matching criteria (e.g., matching based on income per capita and census region) for selecting the supplemental hand-matches (untabulated).

[30] I select controls from the same census quadrant to capture regional commonalities in case types and classifications.

[31] I find that the referral rate result retains its magnitude, sign, and significance after applying entropy balancing on the full set of sample district years as opposed to the CEM and hand-matched sample (untabulated). The prosecution rate result retains the same sign but loses magnitude and significance in the entropy-balanced sample.

group between the pre- and post-treatment periods. This alleviates concerns that changes in control districts may be driving the treatment effect. Second, the insignificance of "online_PFD" implies a lack of baseline differences in referral rates between treated and control districts in the pre-treatment period. This helps corroborate the success of the matching process in selecting matches with similar pre-treatment characteristics. Collectively, these results imply that the treatment effect is driven by referral rate changes within treated districts in the post-treatment period.

The magnitude of the effect in Column (1) indicates that local online PFD is associated with increases in referral volume by .09 per ten-thousand government employees. To contextualize this finding, this effect translates into an increase of 4.1 referrals for the median sample district. Given that the sample median number of referrals per year is 3, an additional 4.1 referrals from online PFD represents a roughly twofold increase in referral volume.

In Column (2), I replace "online_PFD" and "post" with federal district and year fixed effects. The treatment effect remains stable and significant at 5 percent. The overall explanatory power of the model also increases as adjusted R2 rises from .00 to .52. The final and most robust specification in Column (3) includes fixed effects and the full set of monitoring, economic, and political controls. The magnitude of the treatment effect rises to .10 (significant at 5 percent) and the adjusted R2 increases to .53. For the median sample district-year, Column (3) implies that local online PFD is associated with an increase in referral volume by 4.7 per ten thousand government employees. This translates into an increase in referral volume from 3 to 7.7 referrals per year.

Next, I examine whether local online PFD changes the proportion of referrals selected for prosecution (**H2**). The results, summarized in Table 5, suggest that online PFD is associated with increased prosecution rates. Table 5 Columns (1), (2), and (3) similarly report a basic difference-in-differences specification with sequentially added fixed effects and controls. In Column (1), the

coefficients on "online_PFD" and "post" are insignificant, again lending support that the treatment effect is driven by changes within the post-adoption treatment group. However, the overall predictive power of the model remains low, as evidenced by the negative adjusted R2. As with Table 4, I do not rely on this specification to interpret the treatment effect, but rather use Column (1) to illustrate how the estimated treatment effect emerges significant and stable as the model improves upon adding fixed effects and controls (Columns 2, 3). The treatment effect estimate rises in significance and magnitude across all specifications, from .11 in Column (1) to .18 in Column (3). The model's adjusted R2 also grows across all specifications. The final estimate in Column (3) is significant at the 5 percent level and implies that local online PFD raises prosecution rate for the median district-year from 33 percent to 51 percent.

To illustrate this effect in real terms, consider the case of Massachusetts which recently made its PFD available online in 2017. Prior to 2017, the USAO in Massachusetts received a median of 11 referrals per year and prosecuted 25 percent of these referrals. The implied effects of increased referral rates from Table 4 and prosecution rates from Table 5 suggest that local online PFD would raise the annual number of prosecuted referrals in Massachusetts from 3 to 7.

I then explore whether the treatment effects on referral rates (**H1**) and prosecution rates (**H2**) are concentrated in districts with strong external and/or internal monitoring (**H3a** and **H3b**). I begin by partitioning treated districts into two groups according to their respective levels of external monitoring (state ethics budget per employee) and internal monitoring (news circulation per capita) in the pre-treatment year. Treated districts that fall above/below the median are assigned to the high/low external monitoring group, along with their matched control districts.

Table 6 summarizes the results. I find that the treatment effect on prosecution rates is concentrated in districts with high internal monitoring (Table 6, Panel B). This implies state

investments in ethics oversight may complement online PFD in supporting anti-corruption enforcement. Conversely, the referral rate effect does not appear concentrated in high or low monitoring districts (Table 6, Panel A). While these tests suggest where the main effects may be concentrated, they do not indicate that significant differences exist between subgroups (i.e., between high-versus-low internal monitoring districts and high-versus-low external monitoring districts). Overall, I do not detect significant differences across the subgroups.[32]

State Adopter Group

Next, I estimate Equation (1) for the state adopter group, assessing the impact of state online PFD on corruption outcomes. These results are not significant (untabulated).[33,34] This is consistent with the prediction that state officials may influence PFD rules to obscure financial conflicts or avoid incriminating disclosures. Thus, whether the PFD are available via request or online would likely not impact corruption outcomes for state officials. The overall pattern of results suggests that online PFD may be more useful for anti-corruption when the group making PFD disclosures (i.e., local officials) are not also responsible for setting PFD rules (i.e., state officials). Several examples raised during the field interviews point in this direction. For instance, prior to his conviction, Sheldon Silver actively "sought to prevent, and in fact prevented, the disclosure of information about his outside income" to an ethics probe led by Governor Cuomo (DOJ 2015, 6). In 2016, Georgia lawmakers sought to remove the requirement that public officials report

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[32] I also compare districts with either high internal or external monitoring to districts without high monitoring. The interaction with high monitoring districts is positive and insignificant with respect to referral rate, and positive and significant (at 1 percent) with respect to prosecution rate (untabulated). While this suggests that high monitoring may complement online PFD, the findings with respect to H3 are overall not conclusive.

[33] I also re-estimate the model using combined measures of state and local corruption. The results remain insignificant (untabulated). Note that in the state adopter sample, there is a limited pool of potential control districts (n=26) to match to treated districts (n=13). Thus I use the full, unmatched sample for tests of state online PFD adoption.

[34] The results remain insignificant if I restrict the treatment states to only include those which also required local PFD (untabulated). This suggests the main results are not driven by factors related to states which also offer local online PFD.

payments from the state on their personal financial disclosure forms. The adjustment came after the Atlanta Journal-Constitution reported that the House Majority Leader Jon Burns failed to disclose state payments to his private businesses, and was passed after midnight on the final evening of the legislative session. At the time, the State Ethics Commission was reviewing Burns' PFD for indications of impropriety (Godwin 2016). Both cases suggest that state officials wield influence over PFD rules and monitoring, which may not extend to local officials subject to state reporting requirements. In addition, the lack of results may be due to low levels of referrals for corruption at the state level (the full sample contains 2,646 state referrals compared to 7,524 local referrals).

Additional Tests

Returning to the main results on local corruption, another outcome of interest is whether online PFD is associated with changes in sentencing outcomes. Overall, I do not find significant effects of online PFD on the likelihood of punishment conditional on prosecution (untabulated). This raises the possibility that online PFD may drive up referral and prosecution rates unnecessarily if there is no change in sentencing outcomes. However, this result must be approached with caution. First, though almost every district-year contains corruption referrals, actual corruption prosecutions are much rarer. This places limitations on the sample size for tests involving the outcomes of prosecuted cases. Second, my measure of "punishment" only includes specific sanctions defined within the case data (i.e., prison, probation, or fines). Yet there may be many other sanctions on public officials which result from public prosecution (i.e., reputational costs) which are difficult to quantify. There may also be important factors associated with sentencing outcomes (i.e., judge or case characteristics) which fall beyond the modelling scope of this paper. The field interviews further suggest online PFD are important in the early stages of an

investigation – helping enforcement agents and information intermediaries (public, media) detect and refer corruption leads which are attractive for prosecution (Appendix D). Thus, this paper focuses on how online PFD impacts agents' case referral and prosecution processes as opposed to sentencing outcomes.

VII. ROBUSTNESS

I conduct four robustness tests for the main results presented in Tables 4 and 5. First, recent work by Baker, Larcker, and Wang 2022 and Sun and Abraham 2021 raise concerns that staggered difference-in-differences designs may be biased in the presence of heterogeneous treatment effects. One important implication of these findings is that pre-trend estimates we would typically assess using this framework may also be invalid. To address these concerns, I apply a stacked regression design to test the robustness of the main results (Table 7, Panel A) and assess pre-treatment trends (Table 7, Panels B and C). The stacked regression is identical to the standard difference-in-differences regression except district and year fixed effects are replaced with district-dataset and year-dataset indicators. Here, each "dataset" refers to an event-specific dataset of treated and matched control districts aligned in relative time (384). I use the stacked regression to estimate the main results from Table 4 Column (3) and Table 5 Column (3), as well as to plot dynamic effects by eliminating t, the period before online PFD treatment, as the baseline period. In Table 7, I find that the main results are not affected by using stacked regression (Panel A). This suggests that the paper's main results are not driven by comparisons of early versus late-treated states in the presence of treatment effect heterogeneity. I also find that none of the pre-treatment indicator variables are significant for either the referral rate (Panel B) or prosecution rate results (Panel C), offering reassurance regarding parallel trends. The post-treatment indicator variables also indicate that the effects appear with some delay. A potential explanation for this is that the

enforcement process can take a long time to play out (e.g., between leads forming, being received by investigators, and developing into referrals and prosecutions).

Second, I perform a falsification test using placebo outcome variables following Cordis and Warren 2014. The intuition is that changes in state-level rules and procedures for PFD should not impact federal officials. Online PFD should only generate changes in alleged corruption for officials subject to the online PFD treatment. In Table 8 Panel A, I repeat the main results using dependent variables which capture public corruption classified as "federal" by DOJ program category. As expected, I find no significant associations with federal corruption outcomes.

Third, I perform an additional placebo test by randomly selecting a placebo treatment year for each treated state from the pre-treatment period. Table 8 Panel B replicates the results from Tables 4 and 5 using the same treated and matched control districts, altering only the treatment year. I do not find significant effects when the true treatment year is replaced with a placebo.

Fourth and finally, I use Oster's 2017 method to test for the impact of omitted variable bias on my results. I compute Oster's delta statistic using an R^2_{max} of 1.3 times the R^2s of the original controlled regressions, resulting in a delta of -3.4 for the referral rate result (Table 4, Column 3) and 57.9 for the prosecution rate result (Table 5, Column 3). The positive delta for the prosecution rate result implies that unobserved variables must be more important (in this case, over 50 times more important) than observed variables to produce an insignificant result (Oster 2017). This suggests the prosecution rate result is unlikely to be driven by omitted variable bias. While negative deltas cannot bound the magnitude of omitted variable bias, they also suggest that the result is unlikely to be driven by omitted variable bias (Graham, Miller, and Strom 2017).[35]

VIII.   MECHANISM AND DISCUSSION

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[35] This indicates adding controls strengthens the coefficients of interest, suggesting against omitted variable bias.

Though empirical analyses suggest that local online PFD supports the referral and prosecution of corruption cases, the precise mechanism behind these effects remains unclear. To better understand the relationship between online PFD and anti-corruption enforcement, I interviewed 93 federal prosecutors, investigators, and journalists involved in public corruption coverage. In total, I reached out to 826 prosecutors involved in state and local public corruption cases from 2004 to 2017 and interviewed 47, for an overall response rate of 6 percent (effective response rate 10 percent). I also contacted 255 local newspapers representing all 51 states and received 41 responses, for an overall response rate of 16 percent (effective response rate 18 percent). Response rates of 10-18 percent compare favorably with other survey response rates in the literature, which typically range from 5 percent to 15 percent.[36]

The purpose of these interviews was to understand how PFD – and, in particular, online PFD – support corruption investigation and prosecution. From the prosecutor interviews, I learned that overall prosecutors view PFD as having both investigative and evidentiary value.[37] On their own, PFD often do not "make or break" a public corruption case – however PFD are a useful piece of the investigative puzzle. PFD are generally consulted at the beginning to middle of an investigation to help create a baseline for an officials' financial profile. When asked how PFD were directly useful, the most common reasons cited by prosecutors included: provides leads to other evidence (38 percent), helps connect official to third-party organizations (26 percent), and commits official to financial statement at a specific point in time (23 percent) (Appendix D, A-Q2). Though an investigation often begins from public tips or media stories, PFD can help

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[36] For examples, see Brown, Call, Clement, and Sharp 2019 (14.5 percent) and Dichev, Graham, Harvey, and Rajgopal 2013 (5.4 percent). Note that respondents were not told the empirical findings of the paper prior to participating. See Appendix D for interview questions and results.

[37] The majority of respondents (n=32) reported that PFD were "very useful" for supporting corruption investigation, while several found them "somewhat" supportive (n=10) and few "not at all" supportive (n=3) (Appendix D, A-Q1).

prosecutors build the case for starting or furthering a criminal investigation. This early snapshot of the officials' self-reported finances is important because prosecutors must establish probable cause or predication to open an investigation. Opening an investigation facilitates future data requests, including subpoenas for other potential evidence such as tax returns or bank records.

In terms of evidentiary value, PFD often support prosecution when the official has not disclosed some financial benefit they received in exchange for official services. Prosecutors can use nondisclosure to demonstrate criminal intent or consciousness of guilt (81 percent). Nondisclosures can also serve as a critical point of comparison to other financial records (e.g., bank accounts, tax returns, etc.) (12 percent) and be useful for questioning the defendant's credibility (7 percent) (Appendix D, A-Q2).[38] Differences between the public-facing PFD and established transactions can provide evidence of an official's *mens rea* or "consciousness of guilt."

I also find that the medium of PFD availability (online vs. request-based) matters for how prosecutors access and use disclosure information. Most prosecutors (79 percent) felt that online PFD would support the detection and prosecution of public corruption. The major reasons for this included online PFD helping the public (33 percent) and media (26 percent) access information which could support the development of leads and evidence collection. In addition, others pointed out that online PFD allows enforcement agents to covertly access disclosures without issuing subpoenas to state agencies which could tip off potential targets or lead to premature disclosure about an investigation. Preventing information leakage about investigations is especially important in public corruption cases where the defendant is a political figure. Protecting covert access to information was a less-commonly cited benefit of online PFD (5 percent), but points to an important consideration for investigative strategy. In a similar vein, prosecutors remarked that

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[38] According to his indictment, this repeated omission helped establish that former Philadelphia district attorney Seth Williams "intentionally omitted reference to valuable benefits" to conceal bribery (DOJ 2017a, 19).

online PFD can have mechanical benefits in terms of faster information access which is helpful in forming an investigative strategy (Appendix D, A-Q4). Overall, online PFD appears to offer a low-cost, high-speed, and covert mechanism for enforcement agents to get an early-stage picture of an official's self-reported financial interests. Moreover, it allows investigators and prosecutors to benefit from enhanced accessibility of these disclosures to the public and media.

Despite the potential benefits of online PFD, prosecutors remained uncertain if the costs to official privacy would be worth the benefits of online access. The most commonly cited drawback to online PFD was privacy concerns for officials (50 percent), especially given that prosecutors still have the subpoena option (21 percent) (Appendix D, A-Q4). This highlights the tension surrounding state choices to adopt online PFD, a motivating concern for this paper.

The prosecutors' suggestion that online PFD might help the public and media develop leads aligns closely with perspectives from my journalist interviews. I find that PFD are routinely used by political reporters, and online access matters to them. The vast majority (90 percent) of respondents could recall either themselves or their colleagues using PFD as part of coverage for local and/or state officials (Appendix D, B-Q3). All respondents were aware of these disclosures in their state and the majority access these disclosures online if possible (78 percent) (Appendix D, B-Q1). There also does not appear to be a strong substitute for PFD, as most journalists were unsure what alternate data sources might contain data on officials' personal finances (19 percent). These responses suggest that online PFD are particularly useful for journalists, containing information which would be otherwise challenging to obtain.

This fieldwork connects hypotheses from the stylized model with the main conclusions from the empirical analyses. Collectively, the interviews suggest that online PFD is likely to enhance public access to information about official activity and support lead development. Online

access helps enforcement agents covertly and efficiently obtain information on officials' financial backgrounds. This may enable agents to better identify cases worthy of referral and prosecution.

IX. CONCLUSION AND LIMITATIONS

Business and government have stakes in managing public corruption. In this paper, I model information-seeking by investigators under an online disclosure regime (which imposes official privacy costs on society) and a request disclosure regime (which imposes investigation frictions on investigators). As predicted, I find that online PFD for local filers is associated with increased referral and prosecution rates. Field data further suggest that online PFD supports anti-corruption enforcement by reducing disclosure acquisition costs for enforcement agents and the public. These results do not appear to extend to online PFD for state filers, suggesting the effects of online PFD may be dampened when officials can shape the rules around PFD content and accessibility.

This study contributes to prior literature on public disclosure by illustrating how the medium of online disclosure matters for supporting regulatory monitoring. While this paper does not attempt a cost-benefit analysis of online PFD, it offers useful insights for policymakers. For example, policymakers might benefit from understanding how online PFD mitigates multiple forms of disclosure acquisition and integration costs (i.e., by reducing evidentiary and tipoff costs). They may also value field data documenting the importance of online PFD for prosecutors and journalists – establishing that these constituencies regularly access and read public officials' PFD.

While this work offers a first step towards understanding the effects of online PFD, the study has several important limitations. To classify states' motivations for adopting online PFD, the paper relies on a field-based interview approach which may overlook other important changes to online PFD systems. Currently, the paper uses a broad proxy measure (ethics commission budget per employee) to capture many aspects of PFD management and oversight and does not

measure PFD detail both across states and within states across official levels. It also does not examine PFD administered by sub-geographies of the state, or other types of disclosures (i.e., campaign finance disclosures) which may also provide fruitful settings for anti-corruption studies.

Lastly, this study argues that online PFD supports anti-corruption enforcement by reducing disclosure acquisition costs for enforcement agents. While this suggests disclosure processing costs exist in one enforcement context, it raises the possibility that regulators may face processing costs for other public disclosures. I present this initial inquiry into online PFD's impact on anti-corruption enforcement and leave consideration of these additional effects to future research.

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Table 1. Classification of online PFD adopters based on field interviews

Table 1 presents the classification of online PFD adopter states across two dimensions: (1) whether the state adopted online PFD due to efficiency or corruption motivations and (2) whether the state offers online PFD for state and/or local filers. I perform field interviews to classify states according to their motivations for adopting online PFD (see details in Appendix C). The treatment sample includes efficiency-motivated states with treatment dates which allow for seven observation-years within the sample period (2004-2017).

	Efficiency-motivated	*Corruption-motivated*
Local filers	CA, GA+, MN**, NH, PA, SC, MA*	AL, DC*, FL, LA, MS, NE, NV, OR*, TN [AR**]
State filers	AK, AZ*, CA, GA+, HI, KS*, KY**, ME**, MN**, MT, NH, NJ**, NC*, OH**, PA, SC, SD*, MA* [IA*, UT]	AL, DC*, FL, LA, MS, NE, NM, NV, NY, OR*, TN, VA*, WV [AR**, IL]

Notes:
[] Interview resulted in ambiguous classification. Note that NM and AL declined to interview.
* States fall out of sample because online PFD dates fall too close to the end of the sample period to allow for observations three years pre- and post-treatment. Since the sample ends in 2017, an adopter is considered late if they adopted online PFD in 2015 or after.
** States fall out of sample because online PFD dates fall too close to the beginning of the sample period to allow for observations three years pre- and post-treatment. Since the referral sample begins in 2004, an adopter is considered early if they adopted online PFD in 2006 or before.
+ In Georgia, local PFD was only available online from 2008 to 2014.

Figure 1. Pre-treatment trends in public corruption media mentions for sample local adopters

The figures below illustrate trends in national and local news media mentions of public corruption in the three years prior to local online PFD adoption (pre-treatment period) in the sample, as described in footnote 23. Counts of media mentions are standardized based on the earliest pre-treatment year (t-3) to examine differences in coverage trends ("total_news"), and specifically whether there are pre-treatment shifts in coverage trends in the efficiency-motivated adoption group. Overall, there appears to be more shifts in corruption coverage in the corruption-motivated group relative to the efficiency-motivated group. Within the efficiency-motivated group, I do not observe major changes in coverage in the three years prior to online PFD.

A. Efficiency-motivated adopters   *B. Corruption-motivated adopters*

Figure 2. Research design

For its main results, the paper estimates Equation (1) where the treatment indicator, online_PFD_x_post$_{s,l,t}$ equals one from year t+1 if state *s* has made PFD available online for officials in program level *l* in year *t*. The following table summarizes this coding:

Sample year	t-3	t-2	t-1	t	t+1	t+2	t+3
Treated district	0	0	0	0	1	1	1
Control district	0	0	0	0	0	0	0

Table 2. Variable descriptions

Variable type	Variable	Definition
Treatment	online_PFD_x_post	Indicator equals 1 in year t+1 and afterward if the state adopted online PFD in year t.
Independent variables	news_circ	Average daily newspaper circulation, scaled by district population. (Source: Editor and Publisher)
	ethics_budget	State ethics commission budget scaled by government size (full-time equivalent state and local government employees) and logged. (Source: COGEL)
Dependent variables	referral_rate	Number of referrals received per program (state, local, federal) per federal district-year, scaled by government size (full-time equivalent state and local government employees, in tens of thousands). (Source: TRAC)
	prosecution_rate	Proportion of referrals received in each federal district-year by the USAO which result in prosecution (case filing). (Source: TRAC)
	punishment_rate	Proportion of prosecuted referrals received in each federal district-year which resulted in sanctions including prison, probation and/or fines for the defendant. (Source: TRAC)
Controls	inc_per_cap	Per capita personal income (dollars) averaged across counties within each federal district. (Source: BEA)
	unemployment_rate	Average annual unemployment rate calculated as the ratio of unemployed individuals to total labor force, averaged across counties within each federal district. (Source: BEA)
	legal_exp	Expenditures (thousands of dollars) on legal services spent by state and local levels of government, scaled by state population. (Source: U.S. Census)
	edu_rate	High-school educational attainment as a share of the state population. (Source: U.S. Census)
	int_rate	Proportion of adults over the age of fifteen with access to internet within the state. (Source: NTIA)
	leg_maj	Indicator group for political party holding the majority in the state legislature (Democrats, Republicans, or no majority). (Source: NCSL)
	year	Year.
	federal_district	Federal district. Note that data collected at the county level was aggregated to the federal district level using county-to-district assignments listed on the United States Courts' Public Access to Electronic Court Records website. (Source: PACER)

Table 3. Matched sample for local online PFD adopters

Panel A. Selection criteria

Panel A shows the treated and matched control federal districts which constitute the main sample of the paper. The treated districts belong to efficiency-motivated states which adopted local online PFD. Matched control districts belong to states which either: (1) never adopted local online PFD or (2) adopted local online PFD more than three years after the latest treated district. Matched controls are selected by the coarsened exact matching (CEM) algorithm based on income per capita, legislative party control, and census region, unless otherwise noted.

Treatment year	Treated district	Matched controls	Income per capita median	Legislative control	Census region
2012	California,C; California,N; California,E; California,S	Colorado; Hawaii; Washington,E; Oregon; Washington,W	Upper	Dem.	West
2012	New Hampshire	Connecticut; Maine; New Jersey; New York,E; New York,N; New York,S; New York,W; Rhode Island; Vermont; Massachusetts	Upper	Dem.	Northeast
2009	Pennsylvania,E	Alaska; Montana; Virginia,E	Upper	Split/ No maj.	Northeast*
2009	Pennsylvania,M; Pennsylvania,W	Indiana,N; Indiana,S; Kentucky,E; Kentucky,W; Michigan,E; Michigan,W; Ohio,N; Ohio,S	Lower	Split/ No maj.	Northeast*
2008	South Carolina; Georgia,M; Georgia, N; Georgia,S	Texas,E; Texas,N; Texas,S; Texas,W; Virginia,W	Lower	Rep.	South

The matches for Pennsylvania are hand-selected. Pennsylvania districts did not have exact matches within its region of the Northeast due to its split party control of the legislature in the pre-treatment year. Hand-matched controls are matched based on median income per capita and political party control.

Table 3 (Continued)

Panel B. Sample statistics

Panel B shows the summary statistics associated with the matched sample from Panel A. The median federal district income per capita is around $36,781 and the median number of local referrals is 3 per year. While corruption referrals occur in almost every district-year, prosecuted cases (and their associated punishment outcomes) occur more rarely in the sample.

	N	Mean	Std. Dev.	Min.	P25	P50	P75	Max.
Independent variables								
online_PFD_x_post	301	0.12	0.33	0.00	0.00	0.00	0.00	1.00
online_PFD	301	0.28	0.45	0.00	0.00	0.00	1.00	1.00
post	301	0.43	0.50	0.00	0.00	0.00	1.00	1.00
news_circ	301	0.02	0.02	0.00	0.01	0.01	0.02	0.20
ethics_budget	301	1.40	0.78	0.00	0.93	1.46	1.83	5.33
income_per_cap	301	39,218.07	9,996.57	23,829.47	31,361.06	36,781.85	45,242.00	68,453.00
unemployment_rate	301	7.97	2.85	3.31	5.82	7.76	9.42	19.80
legal_exp	301	0.14	0.06	0.06	0.10	0.12	0.18	0.39
edu_rate	301	31.29	5.38	21.10	27.40	30.60	34.70	42.20
int_rate	301	0.83	0.02	0.78	0.82	0.84	0.85	0.87
Dependent variables								
referral_rate	297	0.15	0.26	0.00	0.02	0.06	0.19	2.40
prosecution_rate	248	0.35	0.32	0.00	0.00	0.33	0.55	1.00
punishment_rate	170	0.83	0.29	0.00	0.75	1.00	1.00	1.00

Table 4. Referral rate

Table 4 investigates the impact of local online PFD on the referral rate of local corruption incidents detected by investigative agencies and referred to federal prosecutors. The dependent variable ("referral_rate") is the number of referrals detected by investigative agencies in a given federal district scaled by the number of government employees in that district's state (in tens of thousands). The variable "post" is an indicator variable equal to one for all post-treatment district-years, and "online_PFD" is a treatment indicator equal to one for all districts treated with local online PFD. Additional variables are described in Table 2. Column (1) displays a baseline specification with no fixed effects or controls. Column (2) adds district and year fixed effects, and Column (3) includes monitoring, economic and political controls. Standard errors are clustered at the state level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
online_PFD_x_post	0.086**	0.085**	0.097**
	(2.20)	(2.29)	(2.11)
post	-0.048		
	(-1.39)		
online_PFD	-0.064		
	(-1.12)		
Monitoring controls			
news_circ, ethics_budget	N	N	Y
Economic and political controls			
income_per_cap, unemployment_rate, legal_exp, edu_rate, int_rate, leg_maj	N	N	Y
Fixed effects			
year	N	Y	Y
federal_district	N	Y	Y
Observations	297	297	297
Adjusted R-squared	0.003	0.524	0.533
Robust t-statistics in parentheses	*** p<0.01, ** p<0.05, * p<0.1		

Table 5. Prosecution rate

Table 5 investigates the impact of local online PFD on the proportion of case referrals selected for prosecution. The dependent variable is the proportion of referrals from investigative agencies selected by the USAO for prosecution in each federal district ("prosecution_rate"). The variable "post" is an indicator variable equal to one for all post-treatment district-years, and "online_PFD" is a treatment indicator equal to one for all districts treated with local online PFD. Additional variables are described in Table 2. Column (1) displays a baseline specification with no fixed effects or controls. Column (2) adds district and year fixed effects, and Column (3) includes monitoring, economic and political controls. Standard errors are clustered at the state level. Note that three control districts did not have sufficient observations in either the pre- or post-adoption period and were removed from the sample. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
online_PFD_x_post	0.106	0.134*	0.180**
	(1.59)	(2.01)	(2.44)
post	-0.035		
	(-0.58)		
online_PFD	-0.003		
	(-0.05)		
Monitoring controls			
news_circ, ethics_budget	N	N	Y
Economic and political controls			
income_per_cap, unemployment_rate, legal_exp, edu_rate, int_rate, leg_maj	N	N	Y
Fixed effects			
year	N	Y	Y
federal_district	N	Y	Y
Observations	244	244	244
Adjusted R-squared	-0.004	0.217	0.265
Robust t-statistics in parentheses	*** p<0.01, ** p<0.05, * p<0.1		

Table 6. Subsample tests

Table 6 explores how the main effects of local online PFD on "referral rate" (Table 4) and "prosecution rate" (Table 5) might vary across subsamples with strong and weak external and internal monitoring. The subsamples for external monitoring are defined by splitting the sample into federal districts with above and below-median media coverage ("news_circ") in the pre-treatment year (Columns (1) and (2)). The subsamples for internal monitoring are defined by splitting the sample into districts with above and below-median ethics budget ("ethics_budget") in the pre-treatment year (Columns (3) and (4)). Additional variables are described in Table 2. Standard errors are clustered at the state level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A. Referral rate

	External		Internal	
	High	Low	High	Low
	(1)	(2)	(3)	(4)
online_PFD_x_post	0.145*	0.078*	0.153*	0.142*
	(2.06)	(1.82)	(1.93)	(1.95)
Monitoring, economic, and political controls news_circ, ethics_budget, income_per_cap, unemployment_rate, legal_exp, edu_rate, int_rate, leg_maj	Y	Y	Y	Y
Fixed effects				
year, federal_district	Y	Y	Y	Y
Observations	199	167	160	137
Adjusted R-squared	0.532	0.602	0.537	0.430
Robust t-statistics in parentheses	*** p<0.01, ** p<0.05, * p<0.1			

Panel B. Prosecution rate

	External		Internal	
	High	Low	High	Low
	(1)	(2)	(3)	(4)
online_PFD_x_post	0.169	0.164*	0.264***	0.188
	(1.31)	(1.99)	(3.18)	(0.70)
Monitoring, economic, and political controls news_circ, ethics_budget, income_per_cap, unemployment_rate, legal_exp, edu_rate, int_rate, leg_maj	Y	Y	Y	Y
Fixed effects				
year, federal_district	Y	Y	Y	Y
Observations	152	141	130	114
Adjusted R-squared	0.337	0.235	0.397	0.227
Robust t-statistics in parentheses	*** p<0.01, ** p<0.05, * p<0.1			

Table 7. Robustness: dynamic treatment effects and parallel trends

Recent papers raise concerns that staggered difference-in-differences designs may be biased in the presence of heterogeneous treatment effects. Moreover, assessing pre-trend estimates using this design may be invalid. To address these concerns, I follow Baker, Larcker, and Wang (2022) and apply a stacked regression to test the robustness of the main results and assess pre-treatment trends. The stacked regression is identical to Equation (1) except district and year fixed effects are replaced with district-dataset and year-dataset indicators. Each "dataset" refers to an event-specific dataset of treated and matched control districts aligned in relative time. Panel A, Column (1) uses the stacked regression to re-estimate the referral rate result from Table 4, Column (3) and Panel A, Column (2) re-estimates the prosecution rate result from Table 5 Column (3). Panels B and C use the stacked regression to assess pre-treatment trends for referral and prosecution rate outcomes respectively, replacing online_PFD_x_post with a set of seven relative time indicators. I omit the indicator for t, the period before online PFD treatment, as the baseline period. Vertical bars represent 90% confidence intervals for each point estimate. Standard errors are clustered at the state level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A. Stacked regression

	(1)	(2)
online_PFD_x_post	0.080**	0.218***
	(2.38)	(4.72)
Monitoring, economic, and political controls		
news_circ, ethics_budget, income_per_cap, unemployment_rate, legal_exp, edu_rate, int_rate, leg_maj	Y	Y
Fixed effects		
year-dataset, federal_district-dataset	Y	Y
Observations	297	244
Adjusted R-squared	0.515	0.110
Robust t-statistics in parentheses	*** p<0.01, ** p<0.05, * p<0.1	

Panel B. Dynamic referral rate result   *Panel C. Dynamic prosecution rate result*

Table 8. Robustness: placebo tests

Table 8 includes robustness tests for the results presented in Tables 4 and 5 using a placebo outcome variable (Panel A) and placebo treatment years (Panel B). Following Cordis and Warren (2014), Panel A is a robustness test showing that federal officials are unaffected by changes to local officials' PFD availability. The dependent variables are identical to those used in the Tables 4 and 5 ("referral_rate," "prosecution_rate") using measures of federal corruption as opposed to local corruption. In Panel B, the treatment year is randomly selected from the pre-treatment period. The dependent variables are identical to those used in the Tables 4 and 5 ("referral_rate," "prosecution_rate"). For both panels, additional variables are described in Table 2. Standard errors are clustered at the state level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A. Placebo outcome variable

	(1)	(2)
online_PFD_x_post	-0.027	0.108
	(-0.72)	(1.44)
Monitoring, economic, and political controls		
news_circ, ethics_budget, income_per_cap, unemployment_rate, legal_exp, edu_rate, int_rate, leg_maj	Y	Y
Fixed effects		
year, federal_district	Y	Y
Observations	297	269
Adjusted R-squared	0.451	0.174
Robust t-statistics in parentheses	*** p<0.01, ** p<0.05, * p<0.1	

Panel B. Placebo treatment year

	(1)	(2)
online_PFD_x_post	0.018	0.083
	(0.43)	(0.77)
Monitoring, economic, and political controls		
news_circ, ethics_budget, income_per_cap, unemployment_rate, legal_exp, edu_rate, int_rate, leg_maj	Y	Y
Fixed effects		
year, federal_district	Y	Y
Observations	299	249
Adjusted R-squared	0.430	0.186
Robust t-statistics in parentheses	*** p<0.01, ** p<0.05, * p<0.1	

APPENDIX A. Stylized model

Prop. 1. Referral volume is higher under "online disclosure" than "request disclosure."

In my model, an investigator decides whether to refer a lead. Not referring will generate payoff U_O with certainty. Referring the lead will either generate a high payoff $U_H > U_O$ or low payoff $U_L < U_O$. High payoff (U_H) represents the net benefit of a successful referral that leads to prosecution. The low payoff (U_L) captures the cost of referring a lead to the USAO that does not result in prosecution. Before making a referral, investigators can seek information about the quality of the lead—the posterior probability of U_H occurring after making a referral—via official PFD. If the investigator blindly refers leads without information, then U_H occurs with probability .5.[39]

The investigator's decision problem is akin to executive's problem in Lambert 1986, who seeks additional information when choosing between a safe project (no referral) and a risky project (referral). Following Lambert, I model the additional information signal as r, representing the posterior probability of U_H occurring if the investigator refers the lead. The posterior probability r is uniformly distributed between 0 and 1. Observing r—obtaining information from the PFD—means that investigators will have better information about whether a lead should be prosecuted. I denote a threshold value $\hat{r}$ at which the investigator will refer a lead if $r > \hat{r}$ and not refer if $r < \hat{r}$.

I consider two regimes by which a social planner can make official PFD (the additional information r) available to investigators.[40] First, the social planner can make r *publicly observable* through online PFD ("online disclosure") which imposes a social cost c from official privacy costs. Second, the social planner can make r *privately observable* to the investigator through a request or subpoena ("request disclosure") which imposes investigation frictions on investigators. These frictions reduce the posterior probability r of a successful referral by some constant δ.

In the "online disclosure" regime, for a given lead the investigator publicly observes r and decides whether to refer the lead for prosecution. To find the optimal threshold value $\hat{r}$ under "online disclosure," I solve the investigator's maximization problem given below:

$$\max_{\hat{r}} \quad U_O p_O(\hat{r}) + U_L p_L(\hat{r}) + U_H p_H(\hat{r}) \tag{1}$$

The investigator's expected payoff is a function of the three potential payoffs (U_O, U_L, U_H) and the probabilities of those respective payoffs occurring (p_O, p_L, p_H) which are functions of $\hat{r}$. I infer:

$$\begin{cases} p_O(\hat{r}) = \hat{r} \\ p_L(\hat{r}) = 0.5(1 - \hat{r})^2 \\ p_H(\hat{r}) = 0.5(1 - \hat{r}^2) \end{cases} \tag{2}$$

Substituting these expressions into the investigator's maximization problem (1) and solving for $\hat{r}$ yields the optimal referral threshold r_{OD}^* under the "online disclosure" regime. The second-order condition confirms that r_{OD}^* is a maximum.

Conversely, in the "request disclosure" regime, investigators absorb an information friction penalty if they choose to seek information about r. If the investigator chooses to refer a lead, the probability of U_H occurring is lowered by a friction penalty $\delta \in (0, \frac{U_H - U_O}{U_H - U_L})$. This penalty modifies

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[39] I further assume $U_O > .5 (U_H + U_L)$ such that the investigator will always prefer to view PFD than not view PFD. This is because not viewing PFD will generate a payoff of at *most* U_O for the investigator whereas referring after viewing PFD will generate a payoff of at *least* U_O for the investigator.

[40] I assume investigators act on behalf of the public, and therefore do not require a principal to incentivize them to seek information. Hence, the effort cost of observing r will be normalized to zero under online disclosure.

the probabilities of the high and low payoffs occurring. Substituting these expressions into the investigator's maximization problem (1) and solving for $\hat{r}$ yields the optimal referral threshold r_{RD}^* under the "request disclosure" regime. The second-order condition confirms r_{RD}^* is a maximum.

Comparing the threshold across both regimes demonstrates that the threshold for making a referral under the "request disclosure" regime has increased by the friction cost δ.[41] In other words,

$$r_{RD}^* = r_{OD}^* + \delta \tag{3}$$

Because the threshold for referring leads is higher in the request disclosure regime than in the online disclosure regime, this ought to produce a higher volume of referrals under online disclosure than under request disclosure (**H1**).

Prop. 2. Conditional on referral, leads under "online disclosure" have a higher prosecution probability than those under "request disclosure."

I show that referrals under online disclosure have a higher probability of prosecution than those under request disclosure.[42] I check whether:

$$\mathrm{E}\,[\,r\,|r > r_{OD}^*\,] >^? \mathrm{E}\,[\,r\,|r > r_{RD}^*\,] - \delta \tag{4}$$

$$\Leftrightarrow \delta >^? 0 \tag{5}$$

By definition, $\delta > 0$ is true. Conditional on referral, the probability of leads resulting in prosecution is higher under the "online disclosure" regime compared to the "request disclosure" regime (**H2**).[43]

Prop. 3. "Online disclosure" may be socially optimal compared to "request disclosure" depending on information friction (δ) and privacy costs (c).

I consider the conditions under which online disclosure may be socially optimal. I compare the total expected payoff under online and request disclosure.[44] Online disclosure is optimal if:

$$p_O(r_{OD}^*)U_O + p_L(r_{OD}^*)U_L + p_H(r_{OD}^*)U_H - c > p_O(r_{RD}^*)U_O + p_L(r_{RD}^*)U_L + p_H(r_{RD}^*)U_H \tag{6}$$

Substituting our expressions for r_{OD}^* and r_{RD}^* and simplifying results in the following condition:

$$c < (U_H - U_O)\delta - .5(U_H - U_L)\delta^2 \tag{7}$$

The derivative of the right-hand side of inequality (7) with respect to δ is positive if $\delta < \frac{U_H - U_O}{U_H - U_L}$, which holds by definition of δ. Thus online disclosure is likely optimal if privacy costs c are low, and information friction costs δ are high.

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[41] Note that $\delta \in (0, \frac{U_H - U_O}{U_H - U_L})$ implies that $r_{RD}^* \in (r_{OD}^*, 1)$. If $\delta = 0$, then the optimal cutoff is identical under both regimes. If $\delta = \frac{U_H - U_O}{U_H - U_L}$, then it is optimal for the investigator to never make a referral regardless of the observed r. The information friction costs are so high that the investigator always prefers to receive payoff U_O for certain and never makes a referral. Thus, $\frac{U_H - U_O}{U_H - U_L}$ defines the upward bound of δ.

[42] I compare whether the probability of U_H occurring, conditional on the investigator making a referral, is greater under the "online" or "request" disclosure." Under "online disclosure" investigators make referrals if $r > r_{OD}^*$, whereas under "request disclosure" they make referrals if $r > r_{RD}^*$.

[43] Under alternate assumptions for the distribution of r, this prediction could go in the opposite direction. Testing H2 is ultimately an empirical question, as addressed in the main paper.

[44] Recall that the information friction cost δ is already incorporated in the calculation of r_{RD}^*.

APPENDIX B. PFD treatment dates and links

Note: All websites were accessed in December 2019.

State	Form name	Associated oversight body	Searchable web link	Web link includes disclosures for:		Earliest date of web link for:	
				State	Local	State	Local
Alabama	Statement of Economic Interests	Alabama Ethics Commission	http://ethics.alabama.gov/Search/Public OfficialEmployeeSearch.aspx	x	x	2012	2012
Alaska	Public Official Financial Disclosure (POFD), Legislative Financial Disclosure (LFD)	Alaska Committee on Legislative Ethics	https://aws.state.ak.us/ApocReports/POF D/	x	NA	2013	NA
Arizona	Financial Disclosure Statement	NA	https://azsos.gov/elections/campaign-finance-reporting/financial-disclosure-statements	x	NA	2016	NA
Arkansas	Statement of Financial Interest	Arkansas Ethics Commission	http://www.sos.arkansas.gov/filing_sear ch/index.php/filing/search/new	x	x	2005	2005
California	Statement of Economic Interests, Form 700	California Fair Political Practices Commission	http://www.fppc.ca.gov/transparency/for m-700-filed-by-public-officials/form700-search/form700-old.html	x	x	2012	2012
Colorado	Personal Financial Disclosure	Colorado Independent Ethics Commission	http://www.sos.state.co.us/	NA	NA	NA	NA
Connecticut	Statement of Financial Interests	Connecticut Office of State Ethics	http://www.ct.gov/ethics/cwp/view.asp? a=3510&q=416556	NA	NA	NA	NA
Delaware	Financial Disclosure Report	Delaware Public Integrity Commission	http://sos.delaware.gov/foia_requests.sht ml	NA	NA	NA	NA
D.C.	Public Financial Disclosure Statement	District of Columbia Board of Ethics and Government Accountability	https://ocf.dc.gov/service/archived-financial-disclosure-statements	x	x	2015	2015
Florida	Full and Public Disclosure of Financial Interests (Form 6)	Florida Commission on Ethics	http://public.ethics.state.fl.us/search.cfm	x	x	2006	2006
Georgia	Financial Disclosure Statement	Georgia State Ethics Commission	http://media.ethics.ga.gov/search/Financi al/Financial_ByName.aspx	x	x	2006	2008
Hawaii	Disclosure of Financial Interests	Hawaii State Ethics Commission	http://ethics.hawaii.gov/alldisc/	x	NA	2014	NA

Idaho	NA	NA	NA	NA	NA	NA	NA
Illinois	Statement of Economic Interests	Illinois Secretary of State	http://www.ilsos.gov/economicinterest/economicinterest	x	NA	2004	NA
Indiana	Financial Disclosure Statement	Indiana State Ethics Commission	http://campaignfinance.in.gov/PublicSite/Search.aspx	NA	NA	NA	NA
Iowa	Personal Financial Disclosure form (Legislators and Candidates)	Iowa Ethics & Campaign Disclosure Board	https://www.legis.iowa.gov/legislators/informationOnLegislators/econInterests	x	NA	2017	NA
Kansas	Statement of Substantial Interest	Kansas Governmental Ethics Commission	https://www.sos.ks.gov/elections/ssi/examiner_entry.aspx	x	NA	2015	NA
Kentucky	Statement of Financial Disclosure	Kentucky Legislative Ethics Commission	http://klec.ky.gov/Reports/Pages/Legislators-and-Candidates.aspx	x	NA	2000	NA
Louisiana	Financial Disclosure Statement	Louisiana Ethics Administration	http://ethics.la.gov/PFDisclosure/DisclosureSearch.aspx	x	x	2011	2011
Maine	Financial Disclosure Statement	Maine Commission on Governmental Ethics & Election Practices	https://www.maine.gov/ethics/legislators/disclosure	x	NA	2006	NA
Maryland*	Financial Disclosure Statement	Maryland State Ethics Commission	http://ethics.maryland.gov/employeeoffcials/financial-disclosure/	NA	NA	NA	NA
Massachu-setts	Statement of Financial Interests	Massachusetts Ethics Commission	https://www.mass.gov/how-to/public-inspection-of-sfis	x	x	2017	2017
Michigan	NA	NA	NA	NA	NA	NA	NA
Minnesota	Statement of Economic Interest (Senators and House of Representatives Members)	Minnesota Campaign Finance and Public Disclosure Board	http://www.cfboard.state.mn.us/eis/poatoz.html	x	x	2000	2000
Mississippi	Statement of Economic Interest	Mississippi Ethics Commission	http://www.ethics.state.ms.us/	x	x	2008	2011
Missouri	Personal Financial Disclosure	Missouri Ethics Commission	http://mec.mo.gov/mec/PFD/Home.aspx	NA	NA	NA	NA
Montana	Form D-1 Business Disclosure Statement	Montana Commissioner of Political Practices	https://campaignreport.mt.gov/forms/candidatesearch.jsp	x	NA	2007	NA
Nebraska	Form C-1	Nebraska Accountability & Disclosure Commission	http://www.nadc.nebraska.gov/ccdb/search.cgi	x	x	2014	2014

Nevada	Financial Disclosure Statement	Nevada Commission on Ethics	https://www.nvsos.gov/SOSCandidateServices/AnonymousAccess/CEFDSearchUU/Search.aspx#individual_search	x	x	2014	2014
New Hampshire	Financial Disclosure Form	New Hampshire Attorney General's Office	https://sos.nh.gov/FinInterest.aspx	x	x	2012	2012
New Jersey	Financial Disclosure Statement	Joint Legislative Committee on Ethical Standards	https://www.njleg.state.nj.us/ethics/FinanceDiscloseForms.asp	x	NA	2005	NA
New Mexico	Financial Disclosure Statement	NA	https://portal.sos.state.nm.us/FinancialDisclosure/search.aspx	x	NA	2017	NA
New York	Financial Disclosure Statement	New York State Commission on Public Integrity	https://www.jcope.ny.gov/financial-disclosure-statements-elected-officials	x	NA	2011	NA
North Carolina	Statement of Economic Interest	North Carolina State Ethics Commission	https://ethics.ncsbe.gov/	x	NA	2017	NA
North Dakota	Statement of Interests, required for candidates	NA	https://www2.jlec-olig.state.oh.us/fds/ReportsSearch.aspx	NA	NA	NA	NA
Ohio	Financial Disclosure Statement	Ohio Ethics Commission	https://www2.jlec-olig.state.oh.us/fds/ReportsSearch.aspx	x	NA	1998	NA
Oklahoma	Financial Disclosure Statement	Oklahoma Ethics Commission	http://guardian.ok.gov/	NA	NA	NA	NA
Oregon	Financial Disclosure Statement	Oregon Government Ethics Commission	https://apps.oregon.gov/OGEC/EFS/Records	x	x	2016	2016
Pennsylvan-ia	Financial Interest Form	Pennsylvania Ethics Commission	http://www.ethicsrulings.state.pa.us/	x	x	2009	2009
Rhode Island	Financial Disclosure Statement	Rhode Island Ethics Commission	http://www.ethics.ri.gov/disclosure/	NA	NA	NA	NA
South Carolina	Statement of Economic Interest	South Carolina State Ethics Commission	http://apps.sc.gov/PublicReporting/IndSEI.aspx	x	x	2008	2008
South Dakota	Statement of Economic Interest	NA	https://sdsos.gov/general-information/executive-actions/oaths-of-office/search/	x	NA	2016	NA

Tennessee	Statement of Disclosure of Interests	Tennessee Ethics Commission	https://apps.tn.gov/conflict-app/search.htm	x	x	2011	2011
Texas	Personal Financial Statement	Texas Ethics Commission	https://www.ethics.state.tx.us/filinginfo/pfsforms_ins.html	NA	NA	NA	NA
Utah	Conflict of Interest Financial Disclosure	Utah Office of the Lieutenant Governor	https://house.utah.gov/conflict-disclosures/	x	NA	2014	NA
Vermont	NA	NA	NA	NA	NA	NA	NA
Virginia	Financial Disclosure Statement	Virginia Conflict of Interest and Ethics Advisory Council	http://ethicssearch.dls.virginia.gov/#tabs1-conflict	x	NA	2016	NA
Washington	Personal Financial Affairs Statement	Washington Public Disclosure Commission	https://www.pdc.wa.gov/browse/campaign-explorer	NA	NA	NA	NA
West Virginia	Financial Disclosure Statement	West Virginia Ethics Commission	http://www.ethics.wv.gov/pages/financialdisclosuresearch.aspx	x	NA	2013	NA
Wisconsin	Statement of Economic Interests	Wisconsin Government Accountability Board	https://sei.wi.gov/	NA	NA	NA	NA
Wyoming	State Elected Officials Financial Disclosure	NA	http://soswy.state.wy.us/Elections/Ethics.aspx	NA	NA	NA	NA

*According to its current website, Maryland began offering online PFD in 2019. However, it is unclear from the Wayback Machine at which point these disclosures became publicly accessible. Maryland is not included in the empirical analyses of this paper as its potential adoption year (2019) falls outside the sample period.

APPENDIX C. Efficiency and corruption-motivated adoption classification

In Table 1, I classify U.S. states by (**A**) online PFD adoption motivation (efficiency versus corruption) and (**B**) officeholder level responsible for filing PFD (local versus state officials).

(**A**) First, I classify states according to the underlying motivations behind PFD adoption using field interviews. I categorize adopter states into two buckets: (1) *efficiency-motivated* driven by modernization needs and (2) *corruption-motivated* driven by public corruption concerns. I interviewed state offices which make online PFD available, asking the following questions:

1. *Please describe the history of your offices' financial disclosure system for public officials. For example, how long has the current financial disclosure system been in place?*
2. *What were the reasons which led to your office releasing the personal financial disclosures online?*
3. *Did your office receive any significant support or pushback surrounding the decision to put the disclosures online?*
4. *What constituencies consume personal financial disclosures?*
5. *What role does financial disclosure play in your office's mission of promoting ethics in public office?*

In Table C-1, I tabulate the frequency each motivation cited through my interviews, broken out by their classification group. (Note that one state interview may cite multiple reasons for adoption).[45]

Table C-1. Frequency count for reported online PFD adoption motivations

		Efficiency adopters		Corruption adopters	
	Motivation	*Local*	*State*	*Local*	*State*
Efficiency motivations	1. Convenience and modernization	5	15	0	0
	2. Desire to "practice what you preach"	2	6	2	2
	3. Cost savings	2	9	0	1
	4. Voluntary/office-led initiative	2	9	1	2
Corruption motivations	1. Comprehensive ethics reform	0	0	1	3
	2. Wide-ranging amendment to existing ethics legislation	0	0	3	5
	3. Recent history of public corruption	0	0	3	5
	4. Involuntary/government-led initiative	0*	0*	4	8

*Note: Responses aggregated and anonymized for participant confidentiality. For local (n=1) and state (n=4) efficiency-motivated adopters, there were cases the office responsible for PFD initiated adoption but collaborated with the state government to put PFD online. If a plausibly efficiency-motivated adoption resulted in a legislative rule-change, I ensured a lag time of at least three years between the rule-change and the online availability of PFD.

(**B**) Second, I classify states according to whether they offer online PFD for state or local filers as described in the paper. I adopt a broad definition of "state" versus "local" official to maximize overlap between differing definitions by state, local, and federal institutions. The TRAC data contain referral and case filing data from USAOs tagged by DOJ categories for federal, state, and local corruption, but further categorization criteria is not available. I consider PFD requirements as they apply to officials serving in public office (elected or appointed) rather than candidates.

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[45] Several states had ambiguous or unclear classifications after this process. I refer to secondary sources to confirm the reasons behind online PFD adoption using historical annual reports, minutes or other office publications available on state office websites, WestLaw legislative history notes, media coverage, and historical office websites.

APPENDIX D. Field interview results

To protect respondent confidentiality, responses are aggregated and anonymized. Note that one respondent may cite multiple reasons in response to open-ended questions. Responses reflect the respondents' personal experiences and do not represent the official views of their employers.

Panel A. Federal prosecutors

A-Q1. *Most states across the country require public officials to make personal financial disclosures which are considered public records. To what degree do you feel these disclosures support investigation of public corruption? [i.e., not at all / somewhat / very much]*

	No. Responses	%
Very much	32	68%
Somewhat	10	21%
Not at all	3	6%
No response	2	4%
Total	47	100%

A-Q2. *[If supportive] How are they supportive – directly or indirectly? [i.e., disclosed information supports investigation / non-disclosed information supports investigation]*

A-Q2 – Overall response

	No. Responses	%
Both	25	53%
Indirect	14	30%
Direct	2	4%
No response / NA	6	13%
Total	47	100%

A-Q2 – Reasons why PFD are indirectly supportive

	No. Mentions	%
Demonstrates criminal intent or consciousness of guilt	34	81%
Serves as point of comparison with other financial records	5	12%
Calls into question defendant credibility	3	7%
Total	42	100%

A-Q2 – Reasons why PFD are directly supportive

	No. Mentions	%
Provides leads to other evidence	15	38%
Helps connect official to other third-party organizations	10	26%
Commits official to financial statement at specific point in time	9	23%
Efficient "headstart" on investigations	4	10%
Helps clarify non-illicit transactions	1	3%
Total	39	100%

A-Q3. *[If not] Why are they not supportive? [i.e., redundant, not relevant, not reliable, not accessible]*

	No. Mentions	%
Disclosures too vague	4	57%
Lack of enforcement over disclosures	1	14%
Disclosures not easily searchable	1	14%
Irrelevant content	1	14%
Total	7	100%

A-Q4. *Many states have begun making these disclosures publicly available online. Do you think that public disclosure would support the prosecution of public corruption? Why or why not?*

A-Q4 – Overall response

	No. Responses	%
Yes	37	79%
No	6	13%
No response	4	9%
Total	47	100%

A-Q4 – Reasons why online PFD supportive

	No. Mentions	%
Helps public access information	19	33%
Helps reporters access information	15	26%
Deters officials from committing crime	7	12%
General public awareness	5	9%
Supports covert investigation	3	5%
Helps investigators easily access information	3	5%
Prosecutors are resource-constrained	3	5%
Helps open investigations	1	2%
Helps business competitors generate tips	1	2%
Total	57	100%

A-Q4 – Reasons why online PFD are not supportive

	No. Mentions	%
Privacy concerns for officials	12	50%
Already have subpoena power	5	21%
Deters candidates from seeking public office	2	8%
Disclosures too vague	1	4%
Disclosures not accessible/searchable enough	1	4%
Diminishing number of investigative journalists	1	4%
Corrupt officials will violate the law regardless of online PFD	1	4%
Lack of enforcement over financial disclosures	1	4%
Total	24	100%

Panel B. Journalists

B-Q1. *Most states across the country require public officials to make personal financial disclosures which are considered public records. Are you aware that these disclosures exist?*

	No. Responses	%
Yes	41	100%
Total	41	100%

B-Q2. *[If applicable] Were you aware when your state made these disclosures available online?*

	No. Responses	%
Yes	32	78%
No	2	5%
NA [Not online]	5	12%
No response	2	5%
Total	41	100%

B-Q3. *Have you or your colleagues ever used these disclosures as part of coverage of local and/or state government officials?*

	No. Responses	%
Yes	37	90%
No	4	10%
Total	41	100%

B-Q4. *If yes, what prompted you or your colleagues to consult these disclosures?*

	No. Mentions	%
Routine checks	15	23%
Tips from public	13	20%
Proposed legislation	12	19%
Periodic checks	8	13%
Election coverage	7	11%
Political conflicts	3	5%
NA [not used]	2	3%
Seeking contact information	1	2%
Tips from business competitors	1	2%
Lawsuits	1	2%
No response	1	2%
Total	64	100%

B-Q5. *If PFD were not available, what other data sources might you consult to learn about a public officials' personal finances?*

	No. Mentions	%
Not sure	13	19%
Public tips	8	12%
State business registration records	8	12%
State property records	7	10%
Talk to public officials	5	7%
SEC filings	4	6%
LexisNexis/other news media	4	6%
Nonprofit tax records (CitizenAudit)	3	4%
Social media (LinkedIn, Facebook)	3	4%
Bankruptcy records	3	4%
Official state biographies/personnel files	2	3%
Misunderstood question*	2	3%
Third-party business records	1	1%
Campaign finance reports	1	1%
Lawsuits	1	1%
Divorce proceedings	1	1%
No response	3	4%
Total	69	100%

*Two responses did not contain financial information for state and/or local public officials.