

Rauter, Thomas

Working Paper

Disclosure Regulation, Corruption, and Investment: Evidence from Natural Resource Extraction

Working Paper, No. 286

Provided in Cooperation with:

George J. Stigler Center for the Study of the Economy and the State, The University of Chicago
Booth School of Business

Suggested Citation: Rauter, Thomas (2019) : Disclosure Regulation, Corruption, and Investment: Evidence from Natural Resource Extraction, Working Paper, No. 286, University of Chicago Booth School of Business, Stigler Center for the Study of the Economy and the State, Chicago, IL

This Version is available at:

<https://hdl.handle.net/10419/262688>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Stigler Center

for the Study of the Economy and the State

**Disclosure Regulation, Corruption, and Investment:
Evidence from Natural Resource Extraction**

Thomas Rauter

University of Chicago Booth School of Business

February 2019

New Working Paper Series No. 31

Stigler Center for the Study of the Economy and the State
University of Chicago Booth School of Business
5807 S Woodlawn Ave
Chicago, IL 60637

Disclosure Regulation, Corruption, and Investment: Evidence from Natural Resource Extraction*

Thomas Rauter[†]
February 21, 2019

Abstract

I examine how mandatory disclosure of fiscal payment information in developed countries affects fiscal revenue contributions and investments by multinational firms in less developed countries. In Europe and Canada, extractive firms have to publicly disclose their payments to foreign host governments in a granular report on their corporate website to discourage the bribery of foreign public officials and other illicit payment avoidance practices. Using data on firms' extractive activities abroad and exploiting the staggered adoption of extraction payment reports across developed countries, I find that disclosing companies increase their payments to host governments and that public officials book a higher fraction of these payments into government ledgers, particularly in corrupt countries. However, the higher government revenue comes at a cost – disclosing firms decrease and reallocate investments relative to non-disclosing competitors. Additional cross-sectional evidence indicates that the increased threat of public shaming and legal enforcement are two important mechanisms through which these disclosures generate real effects. Overall, my evidence suggests that extraction payment disclosures improve fiscal revenue collection but have unintended investment consequences for multinational firms.

JEL Classification: G14; G38; H20; H26; K22; L71; M41; M48; O10

Keywords: Real Effects; Disclosure Regulation; Corruption; Fiscal Revenues; Foreign Investment; Corporate Social Responsibility

*This paper is based on the first chapter of my dissertation. I am grateful to my Ph.D. advisors Hans Christensen, João Granja, Christian Laux (chair), and Alexander Mürmann for their generous and invaluable guidance. I thank Milena Amann-Rauter, Ray Ball, John Barrios, Phil Berger, Matthias Breuer, Scott Dyreng (discussant), Luzi Hail, Katharina Hombach, Thomas Jeanjean (discussant), Anya Kleymentova, Christian Leuz, Lisa Yao Liu, Mark Maffett, Maximilian Muhn, Valeri Nikolaev, Christoph Scheuch, Nemit Shroff, Jessica Watkins (discussant), Anastasia Zakolyukina, Josef Zechner as well as workshop and conference participants at Bocconi University, Carnegie Mellon University (Tepper), Dartmouth (Tuck), the EAA Annual Meeting 2018 (Milan), the FARS Midyear Meeting 2019 (Seattle), Frankfurt School of Finance and Management, Harvard Business School, IESE, INSEAD, the International Monetary Fund (IMF), LMU Munich, MIT (Sloan), the University of Chicago (Booth), the University of Mannheim, Stanford University, the University of Pennsylvania (Wharton), the UNC/Duke Fall Camp 2018, and WU Vienna for helpful comments and suggestions. I also thank Dominic Eagleton (Global Witness), Paul Fraix (EU), Oliver Masetti (World Bank), Jean-Philippe Rabine (EU), and Daniel Turnheim (OMV) for providing institutional information and many practical insights. Alexander Amann, Hannah Amann, Tom Kim, and Fabian Nagel provided excellent research assistance. I gratefully acknowledge financial support from the IBM Corporation Faculty Fellowship at the University of Chicago Booth School of Business. First Version: October 10, 2017.

[†]University of Chicago Booth School of Business, 5807 South Woodlawn Avenue, Chicago, IL 60637; Email: Thomas.Rauter@chicagobooth.edu; Phone: +1 (773) 834-3038.

1 Introduction

Multinational corporations from developed countries play an important economic role in developing countries ([Brookings Institution \(2015\)](#)). Foreign firms compensate host countries for their local business activities and make fiscal contributions, for example, in the form of corporate taxes or royalties. However, policymakers are concerned that foreign firms pursue aggressive and often illegal strategies to reduce their payments to host countries that have weak political institutions and low technical capacity ([OECD \(2016\)](#)). According to the [United Nations \(2015\)](#), African countries lost more than 1 trillion USD due to bribery of government officials, abusive transfer pricing, tax evasion, or other illicit practices by multinational companies since the 1970s, which is approximately equal to the official development aid that Africa received over the same time period. Perceptions that foreign multinational firms exploit developing countries undermine efforts by developed countries to end poverty around the world. Several Western governments have therefore recently imposed disclosure regulation on multinational firms to increase payment transparency and reduce illicit financial outflows from developing countries. In this paper, I show that these disclosure mandates have improved fiscal revenue collection in host countries but had unintended investment consequences for multinational firms.

To identify these effects, I use the extractive industries as my empirical testing ground. Extractive companies frequently venture abroad to extract oil, gas, or minerals in foreign countries that are well endowed with natural resources and firms compensate host countries for the resource extraction. Extractive payments are an essential source of government income for many developing countries ([Collier \(2007\)](#)). However, payment losses due to illicit practices by multinational extractive firms amount up to 20% of annual GDP, thereby limiting the extent to which natural resource endowments stimulate economic development in these nations ([Humphreys et al. \(2007\)](#); [Acemoglu and Robinson \(2012\)](#)). For one, host country officials frequently negotiate corrupt deals with extractive companies to receive payment concessions ([EY \(2013\)](#); [Global Witness \(2018\)](#)).¹ For another, extractive firms

¹There are many incidents where government bureaucrats sold licenses to extractive companies at below market prices in exchange for private benefits. Prominent examples include Exxon Mobil in Nigeria ([Global Witness \(2016\)](#)) or Equatorial Guinea ([New York Times \(2016\)](#)).

employ aggressive payment avoidance strategies by underreporting extractive revenues or overreporting project costs.²

To curb fiscal revenue evasion, European and Canadian policymakers recently passed legislation that requires extractive companies to publicly disclose a yearly report on their corporate website that contains detailed project-level information on firms’ payments to foreign governments (“EPD regulation”) ([European Commission \(2013\)](#); [Natural Resources Canada \(2014\)](#)).³ The key difference between EPD disclosures and previous payment reports by host countries is that the information in extraction payment disclosures is substantially more detailed. Unlike before, firm-level payments to governments are not only partitioned by the receiving host country, but also by extractive project and payment type. This additional layer of disaggregation is crucial for the effective monitoring of extractive firms as it allows interested parties (e.g., activist groups) to identify payments that are “too low” by uncovering discrepancies at the more granular project level ([Global Witness \(2018\)](#)).

The extractive sector setting has several desirable features from a research-design perspective. Different countries implemented extraction payment disclosures at different points in time between 2014 and 2017. This staggered adoption allows me to control for concurrent but unrelated market-wide events, which alleviates concerns that my results might be spuriously driven by other economic, regulatory, or institutional changes ([Leuz and Wysocki \(2016\)](#)). In my primary specification, I estimate the effects of extraction payment disclosures by comparing changes in extractive payments and corporate investment between disclosing and non-disclosing firms from around the world. The identifying variation in this generalized difference-in-differences design comes primarily from disclosing firms that are located in Canada, the United Kingdom, and Norway, where many of the largest oil, gas, and mining companies have their headquarters. To mitigate the concern that legislators’ endogenous decision to implement the disclosure regulation could explain my results, I also estimate a *within home country* specification, which compares the outcomes of firms that are headquartered in the same adopting country but become subject to

²A common way for extractive firms to underreport revenues is to sell commodities to themselves at below market prices such that they pay royalties and taxes on only a fraction of the true value of the resource. See, for example, Sasol in Mozambique ([Citi Press \(2017\)](#)) or Cameco in Canada ([Financial Post \(2016\)](#); [CPA Canada \(2017\)](#)).

³Throughout this paper, I use the terms “extraction payment disclosures” and “EPD regulation” interchangeably.

extraction payment disclosures at different points in time because of plausibly-exogenous variation in firms' fiscal year ends (Ball (1980); Mulherin (2007)).

I begin my empirical analysis by examining the effect of extraction payment disclosures on firms' payments to foreign host countries. To this end, I construct a new dataset based on individual host country reports from the *Extractive Industries Transparency Initiative* that cover information on extractive payment practices by multinational oil, gas, and mining firms for 14 countries before and after extraction payment disclosures become effective. This data differs from the information provided in EPD reports since it is (i) compiled by host countries (not firms), (ii) only available at the firm - host country - year level, and (iii) not disaggregated by extractive project and type of payment because this information is not available in the pre-disclosure period. In my empirical tests, I therefore examine the effect of EPD reports on the *coarser* extractive payments that are available both before and after Europe and Canada adopted extraction payment disclosures. I document an increase in extractive payments for disclosing companies of 0.26 standard deviations once EPD regulation becomes effective. This increase in government revenue is not driven by fluctuations in commodity prices or contemporaneous improvements in host countries' overall economic conditions.

Extraction payment disclosures might not only discipline firms but also mitigate agency conflicts between corrupt government officials and civil society in countries where extractive firms operate. For example, the detailed payment disaggregation by payment type could enable watchdogs to verify the government receipt of high-risk one-time payments, such as signature bonuses, and thereby prevent the diversion of extractive revenues from government ledgers into private offshore accounts of the bureaucrats in charge (Global Witness (2018)). To assess this possibility, I examine the impact of EPD reports on extractive payment gaps, which I define as relative percentage differences between the amount that extractive firms send to host governments and the amount that bureaucrats officially book into government ledgers. Payment gaps indicate embezzlement of extractive revenues by government officials and are highly correlated with corruption measures at the host country level (Natural Resource Governance Institute (2017)).⁴ I find that extraction payment disclosures are associated with significantly lower payment gaps and that host countries

⁴Government bureaucrats frequently divert extractive revenues away from government ledgers into private offshore accounts. See, for instance, Shell in Nigeria (Global Witness (2018)) or BP in Angola (Global Witness (1999)).

receive approximately 10 additional cents as government revenue for each dollar that disclosing firms pay as compensation for their extraction activities.

So far, my findings indicate that extraction payment disclosures improve fiscal revenue collection in foreign host countries, which is in line with their main policy objective. However, the disclosure regulation also likely imposes additional costs on extractive firms and might therefore have unintended regulatory consequences. Since disclosing firms increase their transfers to host governments, the net present value of resource extraction projects decreases and firms may invest less. Consistent with this prediction, I find that disclosing companies cut capital expenditures by 0.25 standard deviations (or 26.01%) at the geographic segment level once extraction payment disclosures become effective.

Next, I examine whether the decrease in investments by disclosing firms *relative* to control firms is driven by capital reallocations across companies or mere reductions in extractive activities by regulated oil, gas, and mining firms. The recent repeal of EPD regulation by the Trump administration (ahead of the effective date) raised concerns among NGOs and policymakers that the lack of U.S. extraction payment disclosures would give American firms a competitive advantage in bribing foreign government officials to obtain payment concessions or acquire new extraction licenses ([CNN \(2017\)](#); [Global Witness \(2017\)](#); [Publish What You Pay \(2017\)](#)). To assess this argument, I compare the average residualized investment patterns between disclosing firms and their unregulated U.S. competitors around the adoption of extraction payment disclosures. Treated and control firms have almost identical investment trends in the years leading up to EPD regulation. However, while disclosing firms reduce their capital expenditures, non-disclosing U.S. competitors increase their investment activities following the disclosure regulation. These results suggest that EPD reports promote capital reallocations across firms and that U.S. companies benefit from not having to disclose their extractive payments ([Hsieh and Klenow \(2009\)](#)).

Policymakers argue that corrupt business practices facilitate payment concessions and prevent host countries from obtaining an appropriate, market-based compensation for their natural resource endowments. The risk of collusion between government bureaucrats and extractive firms is most pronounced in corrupt host countries where the local institutional environment is weak ([Shleifer and Vishny \(1993\)](#); [Collier \(2007\)](#)). To more directly gauge the role of corruption in explaining the observed changes in firm behavior, I separately estimate my treatment effects for corrupt versus less corrupt host countries based on

Transparency International's Corruption Perceptions Index. Consistent with the argument that EPD reports mitigate corrupt business practices, I find that the increase in extractive payments and decrease in investments is significantly larger if disclosing firms operate in corrupt environments that facilitate bribery and payment avoidance.

I explore two economic mechanisms to understand *why* firms respond to the disclosure regulation. First, the granular payment information in EPD reports may help activist groups expose corrupt business practices, exert societal pressure through public shaming campaigns, and discipline firms by increasing their expected reputational costs (“public shaming channel”) (Dyck et al. (2008); Graham et al. (2013); Dyreng et al. (2016); Dyreng et al. (2018)).⁵ To quantify shaming risk, I collect data on firms’ media coverage, main distribution channel, and prior shaming experiences. I conjecture that firms that were target of a shaming campaign in the past face higher scrutiny by activist groups going forward. Similarly, firms that face high media attention are more vulnerable to public shaming since activist groups can collaborate with a large set of media outlets to publicly disseminate campaign-specific information (Forbes (2017)). Finally, public shaming is particularly effective if end consumers purchase directly from extractive companies (e.g., via gas stations) because they can instantly punish firms for illegitimate actions by not purchasing their products (BBC (2010)). In cross-sectional tests, I provide evidence that the payment and investment effects are indeed stronger for firms that face a high shaming risk.

As a second mechanism, I posit that extraction payment disclosures could help prosecuting agencies identify suspicious payment behavior and thereby facilitate better enforcement of previously existing anti-corruption laws that criminalize the bribery of foreign public officials such as the U.K. Bribery Act or the OECD Anti-Bribery Convention (“enforcement channel”) (Mills (1998); Bozanic et al. (2017)). Consistent with the argument that EPD reports increase firms’ expected cost of legal prosecution, I find that the treatment effects are particularly strong if companies are headquartered in countries that actively prosecute violations of anti-foreign bribery laws. Overall, my cross-sectional tests provide

⁵In fact, Global Witness, the world’s largest activist group against corruption and exploitation in the extractive industries, has recently developed a handbook on how to use the information contained in extraction payment reports to identify revenue losses (Global Witness (2018)). Tests discussed in this guide include verifying royalty payments based on supplementary data, comparing payment implied commodity prices with international market values, or confirming the government receipt of high risk one-time signature or production bonuses.

support for both the shaming and the enforcement channel, although the evidence for the first mechanism is stronger.

Overall, my results indicate that mandatory disclosure of fiscal payment information in developed countries improves fiscal revenue collection from multinational firms in less developed countries, particularly in corrupt environments. However, the higher government revenue comes at a cost – multinational firms invest less in foreign host countries, which benefits their non-disclosing competitors. The increased threat of public shaming and legal enforcement are two important mechanisms through which fiscal payment disclosures generate real effects in firm behavior.

I make three contributions relative to the existing literature. First, I contribute to the tax literature by showing that granular, public information disclosure of firms’ payments to governments increases fiscal revenues from multinational companies, curbs embezzlement of public funds by government officials, and affects the investment behavior of both regulated firms and their unregulated competitors. In doing so, this paper responds to the call for research by [Dyreng and Maydew \(2018\)](#) on how public disclosure of tax information affects the behavior of the firm, its competitors, and the state. [Hoopes et al. \(2018\)](#) document small increases (decreases) in tax payments for private (public) domestic companies in Australia following the public release of firms’ income tax returns, suggesting differential costs of disclosure across companies. In contrast, I study the payment behavior of multinational firms in a setting where the cost of disclosure is large and find sizable increases in firms’ fiscal contributions once payments to governments are public information. Extraction payment disclosures are part of a larger regulatory agenda that aims to reduce fiscal revenue avoidance by requiring multinational firms to publicly disclose their government payments on a disaggregated, country-by-country (“CbC”) basis ([European Commission \(2019\)](#)). My paper provides direct evidence that CbC reporting in the extractive industries achieves its main policy objective of improving fiscal revenue collection but also highlights that the regulation has unintended investment consequences.⁶

⁶[Joshi \(2018\)](#) studies how large European multinational firms change their tax behavior once they are required to privately report tax information to Western tax authorities on a CbC basis. [Joshi et al. \(2018\)](#) and [Overesch and Wolff \(2018\)](#) examine the tax implications of public CbC reporting by European multinational banks. These papers find that public and private CbC reporting reduces tax avoidance and tax-motivated income shifting among regulated firms in developed countries. In contrast, I show that public CbC reporting enacted in developed countries curbs fiscal revenue evasion by multinational firms in corrupt developing countries. Unlike these prior papers, my paper also examines the unintended investment

Second, I add to the literature on social responsibility reporting, which mainly examines capital market effects.⁷ A recent line of research studies real effects of mandatory CSR disclosures.⁸ Christensen et al. (2017) and Chen et al. (2018) find that CSR disclosure mandates are associated with improvements in the behavior but reductions in the productivity and profitability of regulated firms. I contribute to this literature by showing that if policymakers *unevenly* impose CSR disclosure requirements on only a *subset* of companies in the marketplace, disclosure mandates can have spillover effects on unregulated competitors, which could dampen the aggregate effectiveness of transparency-based approaches to increase corporate social responsibility. This insight may be transferable to traditional, non-CSR disclosure settings in which regulatory interventions create an unlevel disclosure playing field among otherwise similar competitors (e.g., public versus private firms). I thereby also contribute more generally to a recent literature that examines the spillover and resource allocation effects of firm disclosures (Badertscher et al. (2013); Shroff et al. (2014); Breuer (2018); Granja (2018)).⁹

Third, I contribute to a broader economics and finance literature examining the impact of anti-foreign corruption regulation.¹⁰ Prior papers study the effect of legislative changes that prohibit the bribery of foreign public officials on direct investments and economic development in corrupt countries (Hines (1995); Blundell-Wignall and Roulet (2017); Zeume (2017); Christensen et al. (2018)). In contrast, I focus on the consequences of transparency-enhancing anti-corruption initiatives and add to the prior literature by showing that Western disclosure regulation can mitigate illicit practices by multinational firms and government officials in corrupt developing countries that might not have the will or technical capacity to combat corruption themselves.

consequences and competitive spillover effects of CbC reporting, sheds light on the role of corruption, and shows that granular CbC disclosures mitigate fiscal revenue embezzlement by public officials.

⁷Christensen et al. (2019) provide a review of the literature on CSR and sustainability reporting.

⁸Leuz and Wysocki (2016) and Roychowdhury et al. (2018) survey the empirical accounting literature on real effects of disclosure. Kanodia (2006) and Kanodia and Sapra (2016) develop an analytical framework to study real effects of disclosure. Jin and Leslie (2003) and Christensen et al. (2018) study real effects of public information disclosure in non-financial settings.

⁹Johannesen and Larsen (2016), Healy and Serafeim (2017), and Hombach and Sellhorn (2018) document negative abnormal returns for extractive firms around the announcements of EPD regulation in the U.S. and Europe, consistent with investors expecting costly changes in extractive issuers' business activities. In contrast, I examine the ex-post real effects of extraction payment disclosures and their underlying economic mechanisms. My results suggest that EPD reports weaken the competitive position of disclosing firms, which is in line with the ex-ante reduction in firm value.

¹⁰Shleifer and Vishny (1993), Bardhan (1997), and Svensson (2003) provide surveys of the corruption literature.

2 Institutional Setting

By nature of their business, extractive companies frequently venture abroad to extract oil, gas, or minerals in foreign countries that are well endowed with natural resources and firms compensate host countries for the resource extraction. Once a company has successfully acquired an extraction license, an official extraction agreement is set up between the host country and company. This contract specifies the terms of the resource extraction process and governs the official payments that the company makes to the host country. Depending on the stage of the project lifecycle, extractive companies make different kinds of payments such as royalties, license fees, or signature bonuses.¹¹

Economists and policymakers are concerned that host countries do not obtain a fair, market-based share of extractive sector revenues, thereby limiting the extent to which natural resource endowments stimulate economic development in these nations ([Acemoglu and Robinson \(2012\)](#)). According to the [United Nations \(2015\)](#), African countries lost more than 1 trillion USD due to bribery of government officials, abusive transfer pricing, or other illicit business practices since the 1970s, which is approximately equal to the official development assistance that Africa received over the same time period. More than 75% of these illicit financial outflows are attributable to extractive activities in the oil, gas, and mining sectors.¹²

For one, host country officials frequently negotiate corrupt deals with extractive companies ([Collier \(2007\)](#)). The concern is that extractive firms bribe government bureaucrats to receive payment concessions in excess of the illicit kickback ([Financial Times \(2012\)](#)). In this context, even tiny concessions per unit of extracted resource translate into exceptionally high returns to bribery because of nine- or ten-digit extraction volumes typical in oil, gas, and mining projects ([Humphreys et al. \(2007\)](#)). The combination of high returns

¹¹[Open Oil \(2012\)](#) and [Resource Contracts \(2014\)](#) summarize the different stages of the extractive project lifecycle. [Global Witness \(2018\)](#) provides a detailed description of each payment type including examples.

¹²In resource rich developing countries, payment losses amount up to 20% of annual GDP (see, for example, the Republic of Congo, Nigeria, or Chad).

to bribery, weak institutional environments in many resource rich countries, and frequent interactions with government officials make the extractive sector particularly prone to corruption (EY (2013)). Indeed, the OECD (2014) estimates that 19% of all foreign bribery cases occur in the oil, gas, and mining industries, which is higher than in any other sector. For another, extractive companies employ aggressive payment avoidance strategies by underreporting extractive revenues or overreporting project costs (Global Witness (2018)). Moreover, government bureaucrats frequently divert extractive revenues away from official government ledgers into private offshore accounts even if extractive companies make appropriate market-based payments.

In response to these concerns, the Canadian Ministry of Natural Resources and the European Parliament passed separate accounting regulations, which require companies in the oil, gas, and mining industries to publicly disclose their payments to foreign host governments in a granular report, both on their corporate website and the electronic filing platform of their national securities regulator. European policymakers enacted EPD regulation in the form of two directives in June 2013 (Directives 2013/34/EU and 2013/50/EU). Member countries must transpose any European directive into national law within a predetermined time window of two to three years, which results in country-specific effective dates. However, the regulatory act itself is held constant across jurisdictions. In Canada, lawmakers enacted the “Extractive Sector Transparency Measures Act” in December 2014, which entered into force on June 1, 2015. In Table 1, I provide implementation details of EPD regulation for each adopting country.

EPD reports apply to all listed and to large, unlisted extractive companies that are headquartered in Canada or the European Single Market excluding Switzerland.¹³ Extractive firms are required to prepare extraction payment disclosures on an annual basis. EPD reports are almost always published on a different date from annual filings and have to be provided within six months of the firm’s fiscal year end. In the report, extractive pay-

¹³The European Single Market includes the EU member states as well as Norway, Iceland, Liechtenstein, and Switzerland.

ments are broken down in detail by (i) the receiving government institution, (ii) extractive project, and (iii) payment type.¹⁴ Both European and Canadian EPD laws specify identical payment disclosures and define minimum materiality thresholds of EUR or C\$ 100,000 in total annual payments below which firms do not have to provide extraction payment reports. Audit firms review (Europe) or attest (Canada) EPD reports every financial year.

The regulatory objective of extraction payment disclosures is to improve fiscal revenue collection and to reduce corrupt business practices in foreign host countries ([European Commission \(2013\)](#); [Natural Resources Canada \(2014\)](#)). The idea is that EPD reports allow a wide range of interested parties (e.g., NGOs) to better monitor extractive activities, identify payments that are “too low” (red flags), and exert pressure on companies. Extraction payment reports differ from previously available payment disclosures in two important ways. First, information about firm-level extractive payments was dispersed across several reports by different host countries prior to EPD regulation. Specifically, nations that participate in the Extractive Industries Transparency Initiative (“EITI”) publish payments by companies that extract natural resources in the given host country on a firm-year basis. In contrast, EPD reports are a one-stop information source on extractive payments by a particular company across all host countries that firm operates in. Prior to mandatory extraction payment disclosures, firms did not voluntarily provide payment information, neither in their annual filings nor in separate stand-alone reports ([Healy and Serafeim \(2017\)](#)). Second, the payment information contained in EPD reports is substantially more disaggregated compared to previous payment disclosures. Unlike before, firm-level payments to governments are not only partitioned by the receiving host country institution, but also by extractive project and payment type. This additional layer of disaggregation is crucial for the monitoring of extractive firms and host governments as it allows interested parties to identify extractive revenue losses at the more granular project level. For example, prior to the disclosure regulation, public information about project-specific extraction quantities from annual reports and royalty rates from national host country legislation only allowed

¹⁴[Global Witness \(2018\)](#) provides a detailed description of each payment type including examples.

interested parties to determine the royalty payments that firms are *expected to make* for the given project, but not how much these companies *actually paid*.¹⁵ This previously missing information is now for the first time publicly available in extraction payment disclosures, enabling comparisons between what firms should pay and in fact do pay. In Figure IA1, I provide an example of a typical EPD and EITI report and illustrate the difference in payment information before and after the adoption of extraction payment disclosures.

3 Data

3.1 Effective Dates of Extraction Payment Disclosures

I obtain the adoption dates of the staggered roll-out of EPD regulation from the European Commission and the Canadian Ministry of Natural Resources. For each country, I cross-validate the implementation dates with official notifications in federal law gazettes. These notifications specify the entry-into-force dates at which the disclosure regulation was transposed into national law and indicate the first fiscal year in which EPD reports became effective for extractive companies that are listed or headquartered in the particular country.

Table 1 provides implementation details of EPD regulation by home country. Extraction payment disclosures first became effective in Norway for fiscal years starting on or after January 1, 2014. The United Kingdom, Canada, and France followed in 2015. In all remaining countries, extraction payment disclosures became mandatory for fiscal years starting on or after January 1, 2016 or 2017, resulting in an adoption window of three years.

For each sample firm, I verify whether the company actually prepared a payment report and obtain information on the time period it covers. In total, I collect extraction payment disclosures for 421 consolidated oil, gas, and mining companies from 13 different countries. In Panel A of Table 2, I report the number of disclosing parent firms for each regression

¹⁵Tax terms and royalty rates are provided in national legislation and model contracts. If this is not the case, project-specific extraction terms are often publicly accessible in contract repositories such as <http://resourcecontracts.org>.

sample by effective year and find that most companies become subject to extraction payment disclosures in 2015 and 2016. Panel B shows that the vast majority of disclosing firms are located in Canada, Norway, and the United Kingdom, where many of the worldwide largest oil, gas, and mining companies have their headquarters.

3.2 Extractive Payments and Payment Reconciliation Data

I obtain micro-level data on extractive payments to foreign host countries from the Extractive Industries Transparency Initiative (hereafter, “EITI”). The EITI is an NGO based in Oslo, Norway, which promotes the open and accountable management of extractive resources through a global standard that host countries can implement. Countries adopt the EITI standard because of better access to international aid and cheaper funding by the International Monetary Fund, the World Bank, and other financial institutions. Once a nation implements the EITI standard, it has to annually deliver an EITI report, which describes the country’s natural resource value chain in detail. This report includes a reconciliation of extractive payments on a firm-year-host country basis, which covers data on (i) payments made by extractive firms and (ii) payments received by the government. The reconciliation is typically reviewed by a big-four accounting firm, which independently gathers the required payment data from extractive firms on the one hand, and the receiving host government institution on the other hand. The reconciliation covers all extractive companies that are active in a particular host country. If firms refuse to deliver the required data, host countries are required to impose fines on non-complying firms, which include both monetary and reputational penalties. For example, non-complying firms in Liberia are “shamed” by publicly displaying their names and logos on the main streets of Monrovia, the country’s capital city.

I manually collect payment-level data from EITI reconciliation reports for 14 African, Asian, European, and Latin American host countries between 2010 and 2016.¹⁶ Each of the 14 host countries in my sample covers data from extractive companies that are headquartered in Europe, North America, Australia, South Africa, China, or other countries. Adoption of the EITI standard by host countries is voluntary. As a result, corrupt and poorly governed countries might not implement the standard. To the extent that the EITI does not cover the most poorly governed countries in which the real effects of extraction payment disclosures are arguably most pronounced, my inferences are conservative as the sample selection biases my estimates towards zero.

3.3 Firm Fundamentals and Host Country Characteristics

I collect financial statement data for listed extractive firms between 2010 and 2017 from *Compustat Global*, *Compustat North America*, and *Worldscope Geographic Segments*. I restrict my analysis to firms with a two-digit NAICS code of 21 (“Mining, Quarrying, and Oil and Gas Extraction”) or a three-digit NAICS code of 324 (“Petroleum and Coal Products Manufacturing”). I obtain country-level data on corruption perceptions from *Transparency International*.

I truncate all continuous and unbounded variables in my payment and consolidated investment analysis at the 1st and 99th percentile to mitigate the impact of outliers due to data errors. Similarly, I exclude observations from my investment analysis at the firm-segment level if capital expenditures in a single host country are larger than 10% of a company’s *total assets* in the prior fiscal year or if the parent firm’s consolidated assets are less than ten million USD. Table 3 provides descriptive statistics for my regression variables.

¹⁶Specifically, I obtain micro-level payment data for Azerbaijan, Ethiopia, Ghana, Iraq, Ivory Coast, Liberia, Mauritania, Myanmar, Norway, Seychelles, Tanzania, Trinidad and Tobago, the United Kingdom, and Zambia.

4 The Effect of Extraction Payment Disclosures on Fiscal Revenues from Multinational Corporations

4.1 Extractive Payments to Host Countries

I begin my empirical analysis by examining the effect of EPD regulation on the amount of extractive payments that multinational oil, gas, and mining firms make to foreign host governments. Policymakers emphasize that extraction payment disclosures facilitate better monitoring of extractive firms since the payment information contained in EPD reports is substantially more detailed and disaggregated compared to previous payment records (see Section 2). For example, extraction payment reports empower activist groups and anti-corruption prosecutors to identify payment discrepancies and exert pressure on extractive firms by sending letters to the company and relevant host government institution, contacting journalists to encourage media coverage, asking politicians to raise the issue in parliament, or launching a formal anti-bribery investigation. The threat that watchdogs are now able to detect and expose extractive revenue losses via EPD reports may discipline firms not to engage in bribery or other illicit payment avoidance strategies, resulting in higher extractive payments to host countries.

I use a difference-in-differences (DD) design to identify the effect of extraction payment disclosures on firms' transfers to foreign host countries. The DD estimator compares changes in extractive payments around the staggered adoption of the disclosure regulation between disclosing and non-disclosing firms that extract the same type of natural resource in the same host country in the same year across all host countries. More generally, this model estimates the impact of the disaggregated payment information in extraction payment disclosures on the coarser payments from EITI reconciliation reports that are available both before and after the disclosure regulation. Figure 1 illustrates my identification strategy. I estimate the following OLS regression model:

$$\text{Extractive Payment}_{i,hc,t} = \alpha_{hc,t} + \alpha_{i,hc} + \alpha_{r,t} + \alpha_{tr/c,t} + \beta \cdot \text{EPD}_{i,t} + \gamma' \cdot X_{i,t} + \epsilon_{i,hc,t} . \quad (1)$$

The dependent variable *Extractive Payment*_{*i,hc,t*} is the extractive payment by firm *i* to host country *hc* in year *t*, divided by the firm’s lagged total assets and multiplied by 100. *EPD*_{*i,t*} is an indicator variable equal to one beginning in the year in which the disclosure regulation becomes effective for the respective oil, gas, or mining firm. Given the staggered implementation of EPD regulation, different European or Canadian extractive companies get treated at different points in time. Extractive firms headquartered outside of Europe or Canada in, for example, the United States, Australia, or China, do not produce EPD reports and therefore serve as unaffected control group.

*X*_{*i,t*} is a vector of control variables at the parent company level, which includes firm size, return on assets, and leverage. The staggered adoption of EPD regulation allows me to use (high-dimensional) time fixed effects, which alleviates concerns that my results might be driven by concurrent but unrelated market-wide events, such as macroeconomic shocks. Specifically, I include host country-by-year fixed effects $\alpha_{hc,t}$ to control for time-varying host country characteristics (e.g., GDP growth) that could differentially affect my outcome variables across treated and control firms, thereby biasing my inferences. $\alpha_{r,t}$ conditions the DD design on time-varying trends that are common to each type of natural resource, such as changes in commodity prices. I assign firms to resource types based on their three-digit NAICS industry subsector classification.¹⁷ Moreover, I add firm-subsidiary fixed effects $\alpha_{i,hc}$ to control for time-invariant firm characteristics in each host country. Finally, I add treatment or control group-by-year fixed effects to account for other macroeconomic, regulatory, or institutional changes that differentially affect all (eventually) treated and all pure

¹⁷ *Compustat (Global)* specifies the NAICS code for companies headquartered both in and outside of North America. My classification approach results in resource types such as “Oil and Gas Extraction” (three-digit NAICS code 211) or “Mining” (212). In Table IA2, I find that my results remain robust when I use finer resource type definitions based on the four- or five-digit NAICS code (e.g., 2121: “Coal Ore Mining”).

control firms (that never produce extraction payment disclosures). As extractive payments are likely correlated both cross-sectionally and over time within a given home country, I adjust standard errors for within group clusters at the level of the parent company’s headquarter country (Bertrand et al. (2004); Petersen (2009)).

In Table 4, I report the results of my extractive payment regressions. In column (1), I do not control for financial characteristics of the parent company. I find that *EPD* is strongly positively associated with the (normalized) amount of extractive payments (coefficient: 1.969; t-statistic: 1.76). Disclosing companies may make higher payments to host governments compared to non-disclosing firms because they pursue larger extraction projects (e.g., higher royalties and license fees), operate more efficiently and profitably, or are less financially constrained at the time when EPD regulation becomes effective. To alleviate the concern that my results are spuriously driven by these variables, I control for the natural logarithm of the parent company’s lagged total assets, leverage, and return on assets.¹⁸ In column (2), I find that the coefficient of EPD remains stable and does not attenuate. The coefficient magnitude of 2.022 (t-statistic: 2.18) implies that extractive companies increase their transfers to foreign host governments by 0.264 standard deviations (2.022/7.657) once they start disclosing payments in EPD reports.

The negative and statistically significant OLS coefficients of $\ln(Total\ Assets_{t-1})$ and $Return\ on\ Assets_{t-1}$ may seem counterintuitive as they suggest that larger and more profitable extractive companies make smaller payments to host governments. As the profitability estimate is not causally identified, one plausible explanation for the negative association may be that firms which engage in illicit practices need to make smaller transfers to host governments and thus have a higher return on assets (reverse causality). Similarly, large extractive firms typically have more internal resources to design aggressive payment avoidance strategies and can exercise substantial bargaining power over host government officials to obtain

¹⁸Due to a lack of data, I cannot control for time-varying project characteristics such as the current stage of the project lifecycle or the yearly extraction volume. The subsidiary fixed effect only conditions on time-invariant project features such as the (average) size of the extraction project. As a result, the magnitude of my estimates needs to be interpreted carefully.

higher payment concessions for the bribes they pay, giving rise to a negative association between firm size and (normalized) extractive payments.

The result that disclosing firms increase their extractive payments to host governments raises the question of why these companies did not make higher fiscal contributions prior to the disclosure regulation. Policymakers argue that extractive firms obtain payment concessions by either bribing government officials or engaging in other corrupt business practices. To more directly assess the role of corruption in explaining the observed payment increase, I separately estimate my treatment effects for corrupt versus less corrupt host countries. If EPD reports discipline disclosing firms to engage less in corrupt business practices, extractive payments should increase more drastically in corrupt countries where the local institutional environment is weak and the risk of collusion between government officials and extractive firms is high (Shleifer and Vishny (1993); Collier (2007)). To formally assess this argument, I classify host countries as corrupt or less corrupt based on whether Transparency International assigned the country a Corruption Perceptions Index of smaller than or equal to 25 in 2013, the year before EPD regulation was adopted.¹⁹ In column (3), I find that the OLS coefficient of $EPD \times Less\ Corrupt\ Host\ Country$ is positive and (weakly) statistically significant, suggesting that disclosing companies increase their transfers even to less corrupt host countries (coefficient: 2.206; t-stat: 1.78). One plausible explanation for this result is that EPD reports make firms become more cautious in avoiding payments, for example by claiming fewer project development costs against extractive revenues or valuing commodities closer to actual market prices (Global Witness (2018)). However, extractive payment increases are more than twice as high if disclosing firms operate in corrupt host nations, which is consistent with the idea that regulated firms are less willing to offer bribes to corrupt government officials in exchange for payment concessions (coefficient: 5.942; t-statistic: 2.82; p-value of difference in EPD coefficients: 0.003).

¹⁹In 2013, Transparency International's Corruption Perceptions Index ("CPI") ranked 177 countries and territories by their perceived levels of public-sector corruption, using a scale from 0 (highly corrupt) to 100 (uncorrupt).

The key identifying assumption for consistency of my DD estimator is that the payment trends across disclosing and non-disclosing firms would have been the same in the absence of extraction payment disclosures (Roberts and Whited (2012)). While there is no formal test to examine the counterfactual treatment effect, I can assess the validity of this parallel trends assumption. I visualize the estimated treatment effects over my entire sample period by including separate indicators for each year before and after extraction payment disclosures become effective, except for year $t-1$, which I use as a benchmark period (Christensen et al. (2018)). In Figure 2, I find that the payment effects are economically and statistically indistinguishable from zero during the pre-disclosure period, suggesting that the parallel trends assumption is valid.

4.2 Extractive Payment Gaps in Government Ledgers

Extraction payment disclosures might not only discipline firms but also mitigate agency conflicts between corrupt government officials and civil society in countries where multinational extractive firms operate. In this section, I examine the effect of EPD regulation on extractive revenue embezzlement by host country bureaucrats.

Embezzlement of payments from oil, gas, and mining firms is an important source of extractive revenue losses in resource rich countries. Specifically, the notion is that government officials who oversee resource revenues pocket a certain amount of the payments made by extractive firms. As a result, host countries only receive a fraction of the payments that companies initially sent, leading to unexplained payment gaps. Payment gaps indicate embezzlement of extractive revenues by government officials and are significantly correlated with corruption indices at the host country level. For example, the correlation between extractive payment gaps and the Corruption Perceptions Index by Transparency International (scale from 0 to 100; higher values indicate lower corruption) equals -0.180 (p-value: 0.00).

EPD reports provide better information to track the trail of money from paying firms to receiving host governments. The detailed payment disaggregation by project and payment

type enables watchdogs to verify the government receipt of high-risk one-time payments, such as signature or production bonuses, and may thereby prevent the diversion of extractive revenues from government ledgers into private offshore accounts of the bureaucrats in charge ([Global Witness \(2018\)](#)). The increased detection probability of embezzlement by host country bureaucrats may result in lower payment gaps. However, if governance structures in foreign host countries are weak (for example in oppressive authoritarian regimes), the additional information contained in extraction payment reports may not suffice to hold government officials accountable.

To formally examine the impact of extraction payment disclosures on revenue embezzlement by host country bureaucrats, I estimate the following specification:

$$\text{Payment Gap}_{i,hc,t} = \alpha_{hc,t} + \alpha_{i,hc} + \alpha_{r,t} + \alpha_{tr/c,t} + \beta \cdot EPD_{i,t} + \gamma' \cdot X_{i,t} + \epsilon_{i,hc,t} \quad . \quad (2)$$

Payment $\text{Gap}_{i,hc,t}$ is the difference between the payment made by extractive firm i and the corresponding payment officially received by host government hc in year t , normalized by the former. My *EPD* treatment indicator, control variables, and fixed effects are equivalent to equation (1).

In Table 5, I find that EPD reports are strongly negatively associated with payment gaps. The coefficient estimates in the first two columns indicate that host countries receive approximately ten additional cents as government revenue for each dollar that disclosing firms pay as compensation for their extraction activities. In column (3), I document that the decrease in payment gaps is stronger in corrupt environments (p-value of difference in coefficients: 0.001), indicating that extraction payment disclosures are particularly effective in mitigating the embezzlement of government revenues in host countries that suffer from severe agency conflicts between political elites and civil society. Figure 3 shows that disclosed and non-disclosed revenues have similar trends in payment gaps prior to the disclosure regulation.

Overall, the results in this section indicate that extraction payment disclosures improve fiscal revenue collection from multinational firms in two different ways: disclosing firms increase the amount of their extractive payments to host countries and government officials book a higher fraction of these payments into fiscal ledgers. My cross-sectional analysis shows that these effects are particularly strong for payments to corrupt host countries, suggesting that EPD reports play an important role in mitigating corrupt practices by firms and government bureaucrats.

5 Unintended Investment Consequences

So far, my findings indicate that EPD regulation achieves its main policy objective – it improves extractive revenue collection in resource rich countries. However, the disclosure mandate also imposes additional costs on extractive firms and might therefore have consequences for corporate investment. In this section, I examine whether oil, gas, and mining firms change their investment policies in response to extraction payment disclosures. Specifically, I provide evidence on the effect of EPD reports on corporate investment, both at the geographic segment level and the consolidated group level, before I assess whether extraction payment disclosures give rise to capital reallocations across firms from disclosing companies to non-disclosing competitors.

5.1 Predictions

Disclosing companies make higher transfers to host governments since extraction payment disclosures increase firms’ marginal cost of bribery and other illicit payment avoidance practices (see Section 4.1). As a result, the net present value of resource extraction projects decreases and disclosing firms may invest overall less. Within the firm, affected companies likely cut investments with varying intensity across different host countries since firms’ internalized costs of disclosing extractive payments are higher or lower depending on the prevailing level of corruption and other host country characteristics. Given that disclosing

companies have investment opportunities that they did not realize yet, extraction payment disclosures might even change the capital allocation equilibrium within firms in such a way that companies withdraw capital from now unprofitable projects and reallocate it to still profitable undertakings in other geographic segments (Stein (1997)).

Moreover, unilateral EPD regulation gives non-disclosing firms a competitive advantage in bribing foreign government officials to obtain payment concessions or acquire new extraction licenses. Disclosing firms will therefore cut capital expenditures while their non-disclosing competitors likely increase corporate investment. As a result, extraction payment disclosures might trigger capital reallocations across firms (Hsieh and Klenow (2009)).

5.2 Investment Analysis at the Firm-Segment Level

To examine the effect of extraction payment disclosures on corporate investment in host countries, I estimate the following between-country DD specification, which compares changes in firm-segment-level capital expenditures between disclosing and non-disclosing companies around the staggered adoption of EPD regulation:

$$\text{Segment CAPEX}_{i,hc,t} = \alpha_{hc,t} + \alpha_{i,hc} + \alpha_{r,t} + \alpha_{tr/c,t} + \beta \cdot \text{EPD}_{i,t} + \gamma' \cdot X_{i,t} + \epsilon_{i,hc,t} \quad (3)$$

Segment $\text{CAPEX}_{i,hc,t}$ is the amount of yearly capital expenditures by extractive company i in host country hc and year t , divided by the firm's consolidated assets in $t-1$. The definition of my $\text{EPD}_{i,t}$ indicator is identical to the payment analysis. I include the same fixed effects and covariates as in equation (1) and use non-disclosing extractive firms from around the world as a control group.

In column (1) of Table 6, I find that the association between extraction payment disclosures and corporate investment is negative and highly statistically significant (coefficient: -0.776; t-statistic: -2.40), suggesting that the disclosure mandate is costly for regulated

firms. I document that my main coefficient of interest, β , does not significantly attenuate when I control for financial characteristics of the parent company in column (2). The coefficient magnitude implies that disclosing firms cut their segment investments on average by 0.712 percentage points or 0.252 standard deviations following EPD regulation.

Extraction payment disclosures are more informative and particularly costly for firms extracting natural resources in environments that facilitate bribery. Consistent with this argument, in column (3), I find that the decrease in capital expenditures is larger for subsidiaries located in corrupt host countries (coefficient: -1.448; t-statistic: -3.18; p-value of difference in EPD coefficients: 0.078). Moreover, disclosing firms significantly reduce their investments even in less corrupt environments (coefficient: -0.673; t-statistic: -1.95), which is not in line with the idea that extraction payment disclosures trigger project reallocations across countries via disclosing firms' internal capital markets.

In Figure 4, I provide evidence that disclosing firms and non-disclosing control companies have similar investment patterns during the pre-EPD period, suggesting that the parallel-trends assumption is valid ([Roberts and Whited \(2012\)](#)). Moreover, disclosing firms reduce their segment investments sharply once EPD regulation becomes effective, which alleviates the concern that other confounding factors might influence corporate investment and thereby threaten the internal validity of my analysis. Given these treatment dynamics, remaining threats to identification would need to come from omitted variables that are correlated with the distribution of EPD effective dates across adopting countries and concurrent changes in capital expenditures. Although this is not impossible, it seems unlikely. The decrease in segment investments is statistically significant until the end of my sample period.

5.3 Endogeneity of EPD Regulation: Within Home Country-Quarter Analysis at Consolidated Group Level

One concern with identifying the causal investment effects of extraction payment disclosures based on variation in implementation dates across adopting countries is that these dates are not exogenous and that correlated omitted country-level factors which impact investment could also drive legislators' decision to adopt the disclosure regulation (Mulherin (2007)). I address this endogeneity concern by exploiting that within each implementing country, the adoption of extraction payment disclosures across companies depends on firms' fiscal year end date since payment reports have to be published within six months of the last financial year. Moreover, I draw on the fact that in Europe and Canada, extraction payment disclosures do not apply to small and medium sized extractive firms that are not listed.

These institutional features allow me to estimate the following within home country-by-quarter specification, which compares changes in the investment policies of disclosing firms relative to firms that do not disclose yet because their fiscal year ends at a later date and relative to unregulated firms, both of which are located in the same home country:

$$\text{CAPEX}_{i,t} = \alpha_i + \alpha_{r,t} + \alpha_{c,t} + \alpha_{tr/c,t} + \beta \cdot \text{EPD}_{i,t} + \gamma' \cdot X_{i,t} + \epsilon_{i,t} \quad . \quad (4)$$

My dependent variable is the amount of consolidated capital expenditures by extractive firm i in quarter t , normalized by the company's lagged total assets. Specifications (3) and (4) differ from each other in two important ways. First, I now use quarterly instead of annual investment data since parts of the identification in my within home country model relies on quarterly variation in EPD adoption dates. However, information about firms' quarterly capital expenditures is only available for parent companies and, as such, I have to conduct my investment analysis at the consolidated group level instead of the geographic segment level. Second, I therefore replace my host country-by-year with home country-

by-quarter fixed effects $\alpha_{c,t}$, which condition the analysis on time-varying, country specific factors that could influence national legislators' decision to adopt the disclosure regulation.

In column (1) of Table 7, I again find that disclosing firms cut corporate investment once they have to prepare extraction payment disclosures, which corroborates the results of my previous segment-level analysis and suggests that my baseline inferences are not spuriously driven by omitted home country factors (coefficient: -0.341; t-statistic: -5.79). I obtain almost identical and slightly stronger results when I control for financial characteristics of the parent company in column (2).

My consolidated investment sample contains a substantial amount of particularly small, non-disclosing firms that do not provide an investment break-down by geographic segment and mainly extract natural resources domestically. These firms might be so fundamentally different from disclosing companies that imbalances in the empirical distributions of covariates between treated and control firms could bias my statistical inferences and introduce model dependence (Ho et al. (2007)). In fact, in Table IA1, I document that disclosing firms in my consolidated investment sample are on average larger, more profitable, and less highly levered than non-disclosing companies. To improve the estimation of my treatment effects, I coarsen exact match control to disclosing firms based on their financial characteristics at the end of 2013 before the first country adopted extraction payment disclosures. Table IA1 shows that the matching reduces the covariate imbalance for each of the three variables. I find that in the coarsened exact matched sample in column (3), the estimate of EPD remains highly statistically significant (t-stat: -5.70) and increases in magnitude to -0.577, indicating that my baseline inferences in columns (1) and (2) were conservative.

In column (4), I examine the extent to which the investment effects of EPD regulation depend on the actual publication of extraction payment reports. The public release of payment information is likely instrumental for the disciplining role of EPD regulation since interested parties such as activist groups can only use extraction payment reports to identify revenue red flags and exert pressure on firms once the disclosures are publicly

available. In contrast, extractive companies may already adjust their payment and investment behavior when the disclosure regulation becomes effective but before the first report is published because firms might anticipate that their illicit practices will show up in extraction payment disclosures one year into the future. To assess the relative timing of my investment effects, I split the main *EPD* treatment indicator into two mutually exclusive variables. *EPD Published* is a dummy variable equal to one beginning in the quarter in which the firm publishes its first extraction payment report. In contrast, *EPD Effective* captures changes in the investment behavior of disclosing companies between the (firm-specific) effective date of the regulation and the quarter prior to the first public release of the novel payment information. In column (4), I find that European and Canadian firms start reducing corporate investment as soon as extraction payment disclosures become effective and companies' payment behavior is recorded for (future) publication in EPD reports (coefficient: -0.366; t-statistic: -5.64). The investment decrease is significantly larger after firms published their first extraction payment report (coefficient: -0.589; t-stat: -5.32; p-value of difference in EPD estimates: 0.051), which is consistent with the notion that it is not only the effective date but especially the public release of the payment information that is instrumental for disciplining extractive firms.

5.4 Capital Reallocation from Disclosing Firms to Unregulated Competitors

Next, I plot the average residualized capital expenditures from equation (4) for disclosing firms and non-disclosing competitors over time to investigate whether the relative investment decrease is driven by capital reallocations across firms or mere reductions in extractive activities by regulated oil, gas, and mining companies.

The 2017 repeal of EPD legislation by the United States government (ahead of the effective date) raised concerns among NGOs that the lack of U.S. extraction payment disclosures would give American firms a competitive advantage in bribing foreign government

officials to obtain payment concessions or acquire new extraction licenses, both of which could give rise to capital reallocations across firms ([CNN \(2017\)](#); [Global Witness \(2017\)](#); [Publish What You Pay \(2017\)](#)). To assess this argument, I compare the average investment patterns between European disclosing firms and their unregulated U.S. competitors around the adoption of extraction payment disclosures.

For ease of exposition, I normalize the residualized investments of disclosing and non-disclosing firms by each group's standard deviation, average by year, and subtract the mean of the benchmark period 2014. To compare average capital expenditures *within the same time period* across treatment and control groups, I focus on investment changes around the year 2015 since the majority of European extractive firms became subject to EPD regulation at the beginning of that year.

In Figure 5, I document that treated and control firms have almost identical investment trends in the years leading up to the disclosure regulation, again suggesting that the parallel trends assumption is satisfied. However, the investment patterns of both groups diverge as soon as extraction payment disclosures become effective. While disclosing European firms reduce their capital expenditures, non-disclosing U.S. competitors increase their investment activities.

Overall, the evidence in this section suggests that extraction payment disclosures have unintended regulatory consequences. EPD reports raise marginal investment costs for regulated companies, particularly in corrupt host countries, and facilitate capital reallocations across firms from disclosing companies to unregulated competitors.

6 Economic Mechanisms: How Do Extraction Payment Disclosures Affect Firm Behavior?

My previous analyses show that disclosing firms increase their extractive payments but decrease and reallocate investments following EPD regulation. In this section, I explore two

economic mechanisms to examine *how* extraction payment reports discipline the behavior of disclosing firms.

As a first mechanism, I focus on public shaming and posit that extraction payment disclosures facilitate better monitoring by activist groups, which identify payment discrepancies and expose illicit firm behavior via shaming campaigns in collaboration with the media (Miller (2006); Dyck et al. (2008); Global Witness (2018)). Disclosing companies change their behavior to avoid public pressure that could result in a costly backlash from customers and investors against the firm or its products (Hanlon and Slemrod (2009); Graham et al. (2013); Dyreng et al. (2016)).

As a second mechanism, I hypothesize that extraction payment disclosures might help prosecuting agencies identify suspicious payment behavior and thereby facilitate better enforcement of previously existing anti-corruption laws that criminalize the bribery of foreign public officials such as the U.K. Bribery Act or the OECD Anti-Bribery Convention. In this vein, EPD reports might increase expected prosecution costs for regulated companies and give rise to changes in firm behavior.

To empirically assess these mechanisms, I introduce two non-overlapping partitioning variables into my baseline payment and investment specifications (equations (1) and (3)). My partitioning variables are proxies for firms' shaming risk or enforcement exposure and capture high or low realizations of the given firm characteristic. I interact both partitioning variables with my *EPD* treatment indicator and test for significant cross-sectional differences to shed light on the shaming and enforcement channel.

6.1 Public Shaming Channel

If extraction payment disclosures discipline firms through increased vulnerability to public pressure, the observed payment and investment patterns should be stronger for companies with higher expected shaming costs. I quantify shaming exposure in three different ways.

First, I focus on firms' prior shaming experiences. Companies that have been targeted by shaming campaigns in the past face stricter scrutiny by activist groups going forward and are more aware of the adverse reputational consequences of NGO interventions. I manually collect data on the targets of all extractive sector campaigns by the world's nine largest activist groups since 2000 and partition disclosing firms by whether they have been shamed prior to the adoption of extraction payment disclosures.²⁰ In columns (1) and (4) of Table 8, I find that the increase in extractive payments and decrease in segment investments is indeed stronger for disclosing firms that have been the target of an NGO shaming campaign in the past (p-value of difference in EPD coefficients: 0.019 (payments), 0.026 (investments)).

Second, extractive firms that experience high media attention are more vulnerable to public shaming since activist groups can collaborate with a larger set of media outlets to publicly disseminate campaign-specific information and thereby exert pressure on disclosing companies (Dyck et al. (2008); Peress (2014); Tetlock (2015); Gao et al. (2018)).²¹ To test whether the magnitude of my treatment effects increases in media coverage, I compute each firm's average annual number of unique, English newspaper mentions in the business press between the year 2000 and the adoption of extraction payment disclosures based on press coverage data that I collect from *Factiva*. I classify companies as *High (Low) Media Coverage* if their average media coverage exceeds (is below) the 75th percentile of all sample firms. In columns (2) and (5), I interact both media coverage indicators with my *EPD* treatment variable and find that the payment and investment effects are significantly stronger for disclosing firms that experience high media attention (p-values of coefficient differences: 0.050, 0.009).

²⁰Specifically, I obtain information about NGO shaming campaigns from the websites of Global Witness, the Natural Resource Governance Institute, Publish What You Pay, Transparency International, the World Resources Institute, Tax Justice Network, Oxfam, Earthrights International, and Greenpeace.

²¹See BBC (2017) and Forbes (2017) as examples where the business press rebroadcasted a recent shaming campaign by Global Witness against Shell, which uncovered that the company bribed Nigerian government officials to gain access to OPL 245, one of Africa's most valuable offshore oil blocks.

Third, public shaming is particularly effective if end consumers purchase directly from extractive companies (e.g., via gas stations) because they can instantly punish firms for illegitimate actions by not buying their products anymore.²² In contrast, it is more difficult for consumers to exert pressure if end products only contain certain extractive components that firms sell via wholesale distribution channels because consumers cannot easily distinguish socially responsible from burdened goods. To formally assess this argument, I manually collect data on the main distribution channel of each extractive firm in my sample from annual filings. In columns (3) and (6) of Table 8, I document that the changes in payment and investment behavior are concentrated among firms that sell their products in direct-to-consumer markets. In contrast, I do not find significant treatment effects for companies that distribute via wholesale channels.

6.2 Enforcement Channel

Prior to the adoption of extraction payment disclosures, many developed countries already had anti-foreign corruption *legislation* in place to fight corrupt business practices by Western companies in corrupt countries. For example, the OECD Anti-Bribery Convention of 1997 criminalizes the bribery of foreign public officials and is currently in force in 45 countries, including Canada and all member states of the European Union ([OECD \(2011\)](#)). Despite these regulatory efforts, extractive companies continued to bribe host country bureaucrats to obtain payment concessions and acquire or retain business. In fact, the [OECD \(2014\)](#) estimates that 19% of all foreign bribery cases occur in the oil, gas, and mining industries, which is higher than in any other sector. For one, the combination of high returns to bribery, weak institutional environments in many resource rich countries, and frequent interactions with government officials make the extractive sector particularly prone to corruption ([EY \(2013\)](#)). For another, the enforcement of anti-bribery legislation

²²For example, BP faced substantial declines in gasoline sales following consumer boycotts orchestrated by NGOs in response to the Deepwater Horizon oil spill in the Gulf of Mexico in 2010 ([BBC \(2010\)](#); [The Telegraph \(2010\)](#)).

was limited and partially ineffective since home country prosecutors lacked information about firms' payments to foreign host countries.

Extraction payment disclosures might facilitate better enforcement of existing anti-corruption laws by helping prosecutors uncover suspicious payment behavior, build foreign bribery cases, and ultimately take enforcement actions against disclosing firms. In economic terms, EPD reports raise firms' expected legal costs by increasing the detection probability of corrupt business practices. If improved enforcement is at the heart of my results, the real effects of extraction payment disclosures should be stronger for firms from countries that have a history and reputation of punishing violations of foreign corruption legislation.

To test this prediction, I obtain enforcement data of the OECD Anti-Bribery Convention from Transparency International (TI). I partition firms' headquarter countries into two groups, *Strong* or *Weak Anti-Corruption Enforcement*, depending on whether TI classified the nation as an active enforcer of the OECD Anti-Bribery Convention in 2013, prior to the adoption of extraction payment disclosures. TI categorizes countries as active or non-active based on a yearly enforcement index, which reflects the number and severity of both ongoing and concluded bribery cases ([Transparency International \(2014\)](#)).

In Table 9, I document that the payment and investment effects are particularly strong if disclosing firms are headquartered in countries that aggressively prosecute violations of anti-foreign bribery laws. These results are consistent with the notion that EPD reports facilitate the enforcement of prior foreign corruption regulation and that extractive firms adjust their behavior in response to the increased threat of legal action. While the coefficient differences in my cross-sectional enforcement tests are economically large, they are not (column (1)) or only marginally (column (2)) statistically significant. This might not be surprising given that I identify the effects based on limited variation in enforcement intensity across disclosing firms' home countries. Readers should interpret Table 9 with this caveat in mind.

Taken together, the results in this section suggest that extraction payment disclosures trigger real effects by increasing firms' expected cost of public shaming and legal prosecution. In relative terms, my cross-sectional evidence is stronger for the shaming than the enforcement mechanism.

6.3 Potential Other Channels

EPD regulation might generate real effects through additional mechanisms. For example, extraction payment disclosures could increase the bargaining power of host country officials vis-à-vis extractive firms ("bargaining power channel"). In a hypothetical world where all extractive firms around the globe have to uniformly disclose their payments and government officials act in the best interest of their country, bureaucrats could pressure firms into paying more since they can now observe other payments from the same firm to neighboring host countries, which could help them uncover unfair deals. In reality, however, only European and Canadian firms disclose their payments and government officials are willing to take bribes for facilitating business. Therefore, instead of imposing the increased negotiation power on disclosing firms to receive higher official payments which then flow into government ledgers, host country officials still have strong incentives to transact in a corrupt fashion with non-disclosing firms to receive private benefits.

In the absence of corruption, extraction payment disclosures could also help host countries improve their own measures of how much they receive and thereby alleviate asymmetric expertise relative to extractive firms ("measurement channel"). In this case, government officials would be able to better monitor *both* disclosing and non-disclosing firms. My results are inconsistent with the measurement channel since I find that disclosing companies increase their extractive payments but decrease investments *relative* to unregulated competitors that extract the same type of natural resource in the same host country in the same year.

7 Robustness Tests and Extensions

In Table IA2, I present several robustness tests for the main results reported in Tables 4 and 6. Overall, my main inferences are robust to a variety of different sampling and research design choices.

First, I estimate equations (1) and (3) only within disclosing firms and thereby identify the treatment effects of EPD regulation entirely based on variation in effective dates across European and Canadian companies. One identifying assumption of my difference-in-differences design is that the treatment status of disclosing firms does not affect the payment and investment behavior of unregulated control companies and vice versa (Glaeser and Guay (2017)). This stable unit treatment value assumption (SUTVA) might be violated in my setting as EPD regulation seems to benefit unregulated firms when they compete for natural resources with disclosing companies (see Figure 5). I assess whether non-compliance with the SUTVA assumption inflates or potentially even drives my treatment effects by excluding non-disclosing firms from my main regression samples. In column (1) of Table IA2 (Panels A and B), I find that the payment coefficient remains stable (beta: 1.982; t-statistic: 5.52) while the investment estimate slightly attenuates but continues to be statistically significant (-0.589; -2.15).

Second, I assess whether my inferences are potentially confounded by unrelated information contained in annual filings. Approximately 97% of companies that provide extraction payment disclosures list their payments to host governments in a stand-alone report which they publish separately from the annual filings. In column (2), I find that my payment and investment effects are robust to removing those 3% of firms that embed extraction payment information into their annual report.

Third, I use a finer industry classification to assign extractive companies to resource types. One potential concern with my baseline empirical model is that the classification based on firms' three-digit NAICS code is relatively coarse and that my resource type-by-time fixed effect does not properly absorb all confounding variation in extractive payments

and corporate investment resulting from price changes in individual commodities. I alleviate this concern by using a finer resource type definition based on firms’ four-digit NAICS code, which specifies the main type(s) of natural resource for each parent company in my sample (e.g., 2121: “Coal Ore Mining”). The results mirror those of Table 4 and 6.²³

Fourth, I apply different sample selection criteria and definitions for my dependent variables. My inferences remain unchanged when I do not trim but instead winsorize extractive payments at the 1st and 99th percentile (column (4), Panel A). In Panel B, I find that the investment results are robust to removing firms’ minimum size threshold of ten million USD in total consolidated assets.

Fifth, I assess whether the real effects of extraction payment disclosures materialize abroad or whether disclosing firms also adjust their payment and investment behavior domestically in their headquarter country. In column (5) of Panel A, I document that the increase in extractive payments is only statistically significant for foreign host countries (t-statistic: 2.27) but that the corresponding OLS estimate is as high as in domestic segments (p-value of differences in EPD coefficients: 0.967). A speculative interpretation of this result is that extraction payment reports also mitigate illicit payment avoidance practices in local operations. In contrast, disclosing firms only cut segment investments in foreign host countries (coefficient in Panel B: -1.239; t-stat: -4.20) and do not alter their domestic capital expenditures (p-value of coefficient differences: 0.020). Overall, these results indicate that EPD reports trigger changes in firm behavior mostly abroad, which is in line with their regulatory objective.

8 Conclusion

I examine how disclosure regulation enacted in developed countries affects fiscal revenue contributions and investments by multinational firms in less developed countries. In Europe

²³In unreported results, I also find that my results remain robust when I use five-digit NAICS-by-year fixed effects (extractive payments: t-stat = 2.27; segment investments: t-stat = -1.64).

and Canada, extractive firms have to publicly disclose their payments to foreign host governments in a granular report on their corporate website to mitigate fiscal revenue evasion due to the bribery of public officials or other illicit business practices. Extraction payment disclosures are substantially more detailed compared to previous payment records and allow watchdogs to identify payment discrepancies and exert public or legal pressure on extractive firms.

I exploit plausibly-exogenous variation in the adoption of extraction payment reports across developed countries and firms' fiscal year ends to disentangle the disclosure effects from concurrent but unrelated macroeconomic or regulatory changes. Using data on firms' extractive activities abroad, I find that disclosing firms increase the amount of their extractive payments to host countries and that government officials book a higher fraction of these payments into fiscal ledgers. However, the higher government revenue comes at a cost – extractive firms invest less in foreign host countries. The increase in payments and decrease in investments is particularly strong for companies that operate in corrupt host countries, suggesting that extraction payment reports play an important role in mitigating corrupt practices by firms and government bureaucrats. Unregulated competitors benefit from the unlevel disclosure playing field and increase their capital expenditures in response to the regulation, giving rise to capital reallocations from disclosing to non-disclosing firms. In additional cross-sectional tests, I find that the increased threat of public shaming and legal enforcement are two important mechanisms through which extraction payment disclosures generate real effects in firm behavior. Overall, my results suggest that fiscal payment disclosures improve fiscal revenue collection in foreign host countries but have unintended investment consequences for multinational firms.

The findings of this paper should be interpreted with two caveats in mind. First, my focus on extraction payment disclosures in the oil, gas, and mining industries could limit the external validity of my findings (Glaeser and Guay (2017)). While the extractive sector setting enables better identification along the causal path, my inferences on the fiscal pay-

ment effects, investment consequences, competitive spillovers, and economic mechanisms are likely generalizable to public tax disclosure mandates with similar institutional features (e.g., proposed, public country-by-country reporting for large, multinational enterprises in the EU across all sectors ([European Commission \(2019\)](#))).

Second, my paper cannot speak to the aggregate effect of extraction payment disclosures on economic development in foreign host countries since my research design absorbs any confounding variation from potentially correlated omitted country-level factors (such as GDP growth). Conceptually, it is unclear whether extraction payment disclosures enhance or impair economic conditions in resource rich countries given that the disclosure regulation improves fiscal revenue collection but discourages corporate investment and facilitates capital reallocations from regulated to unregulated firms. I leave the investigation of country level effects to future research.

References

- Acemoglu, D. and J. A. Robinson (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. Crown Publishers.
- Badertscher, B., N. Shroff, and H. D. White (2013). Externalities of Public Firm Presence: Evidence from Private Firms' Investment Decisions. *Journal of Financial Economics* 109(3), 682–706.
- Ball, R. (1980). Discussion of Accounting for Research and Development Costs: The Impact on Research and Development Expenditures. *Journal of Accounting Research* 18, 27–37.
- Bardhan, P. (1997). Corruption and Development: A Review of Issues. *Journal of Economic Literature* 35(3), 1320–1346.
- BBC (2010). Just How Angry are People at BP? <http://www.bbc.com/news/10233882>. Accessed: 2017-07-25.
- BBC (2017). Shell Corruption Probe: New Evidence on Oil payments. <https://www.bbc.com/news/business-39544761>. Accessed: 2018-11-16.
- Bertrand, M., E. Duflo, and S. Mullainathan (2004). How Much Should We Trust Differences-In-Differences Estimates? *Quarterly Journal of Economics* 119(1), 249–275.
- Blundell-Wignall, A. and C. Roulet (2017). Foreign Direct Investment, Corruption and the OECD Anti-Bribery Convention. *OECD Working Papers on International Investment*.
- Bozanic, Z., J. L. Hoopes, J. R. Thornock, and B. M. Williams (2017). IRS Attention. *Journal of Accounting Research* 55(1), 79–114.
- Breuer, M. (2018). How Does Financial Reporting Regulation Affect Market-Wide Resource Allocation? *Working Paper, Columbia University*, 1–117.
- Brookings Institution (2015). Do Multinational Corporations Play a Role in Entrepreneurship in Developing Countries? <https://www.brookings.edu/blog/up-front/2015/11/03/do-multinational-corporations-play-a-role-in-entrepreneurship-in-developing-countries/>. Accessed: 2019-02-06.
- Chen, Y.-C., M. Hung, and Y. Wang (2018). The Effect of Mandatory CSR Disclosure on Firm Profitability and Social Externalities: Evidence from China. *Journal of Accounting and Economics* 65(1), 169–190.
- Christensen, H. B., E. Floyd, L. Y. Liu, and M. Maffett (2017). The Real Effects of Mandated Information on Social Responsibility in Financial Reports: Evidence from Mine-Safety Records. *Journal of Accounting and Economics* 64(2-3), 284–304.
- Christensen, H. B., E. Floyd, and M. Maffett (2018). The Only Prescription is Transparency: The Effect of Charge-Price-Transparency Regulation on Healthcare Prices. *Working Paper, University of Chicago*.
- Christensen, H. B., L. Hail, and C. Leuz (2019). Economic Analysis of Widespread Adoption of CSR and Sustainability Reporting Standards. *Working Paper, University of Chicago and University of Pennsylvania*.

- Christensen, H. B., M. G. Maffett, and T. Rauter (2018). Policeman for the World: US Enforcement of Foreign Corruption Regulation and Corporate Behavior in Corrupt Countries. *Working Paper, University of Chicago*.
- Citi Press (2017). Sasol Deal Rips Off Mozambique. <http://www.fin24.com/Companies/Industrial/sasol-deal-rips-off-mozambique-20170219-2>. Accessed: 2017-06-19.
- CNN (2017). House Republicans Look to Roll Back Transparency Law for Energy Companies. Available at: <http://edition.cnn.com/2017/01/31/politics/oil-industry-regulations/>. Accessed: 2017-05-16.
- Collier, P. (2007). *The Bottom Billion: Why the Poorest Countries are Failing and What Can Be Done About It*. Oxford University Press.
- CPA Canada (2017). Cameco: Landmark Transfer Pricing Case Begins. <https://www.cpacanada.ca/en/connecting-and-news/news/professional-news/2017/january/cameco-landmark-transfer-pricing-case-begins>. Accessed: 2017-06-17.
- Dyck, A., N. Volchkova, and L. Zingales (2008). The Corporate Governance Role of the Media: Evidence from Russia. *Journal of Finance* 63(3), 1093–1135.
- Dyrengr, S., J. L. Hoopes, P. Langetieg, and J. H. Wilde (2018). Strategic Subsidiary Disclosure. *Working Paper*.
- Dyrengr, S. D., J. L. Hoopes, and J. H. Wilde (2016). Public Pressure and Corporate Tax Behavior. *Journal of Accounting Research* 54(1), 147–186.
- Dyrengr, S. D. and E. L. Maydew (2018). Virtual Issue on Tax Research. *Journal of Accounting Research*.
- European Commission (2013). New Disclosure Requirements for the Extractive Industry and Loggers of Primary Forests in the Accounting (and Transparency) Directives - Frequently Asked Questions.
- European Commission (2019). Public Country-by-Country Reporting. <https://ec.europa.eu/info/business-economy-euro/company-reporting-and-auditing/company-reporting>. Accessed: 2019-01-30.
- EY (2013). Vision and Priorities of Mary Jo White.
- Financial Post (2016). Cameco and the CRA Head to Court over Potential CAD 2.2-Billion Tax Dispute. <http://business.financialpost.com/news/cameco-and-the-cra-head-to-court-over-potential-2-2-billion-tax-dispute>. Accessed: 2017-06-19.
- Financial Times (2012). Oil and Gas Has Highest Bribery Rate. Available at: <https://www.ft.com/content/c84ead24-ce7e-11e1-bc0c-00144feabdc0>. Accessed: 2016-11-29.
- Forbes (2017). Shell Knew Of Bribe Payments To Nigerian Official, Global Witness Report Alleges. <https://www.forbes.com>. Accessed: 2018-11-16.

- Gao, P., C. Lee, and D. Murphy (2018). Financing Dies in Darkness? The Impact of Newspaper Closures on Public Finance. *Journal of Financial Economics*, *Forthcoming*.
- Glaeser, S. and W. R. Guay (2017). Identification and Generalizability in Accounting Research: A Discussion of Christensen, Floyd, Liu and Maffett (2017). *Journal of Accounting and Economics* 64(2-3), 305–312.
- Global Witness (1999). A Crude Awakening. <https://www.globalwitness.org/en/archive/crude-awakening/>. Accessed: 2017-06-17.
- Global Witness (2016). Probe into Murky ExxonMobil Deal Shows Why Strong U.S. Transparency Rules are Needed for Oil Companies. <https://www.globalwitness.org/en/press-releases/probe-murky-exxonmobil-deal-shows-why-strong-us-transparency-rules-are-needed-oil-companies/>. Accessed: 2017-06-19.
- Global Witness (2017). Vote No on H.R. 4519 which would repeal the Cardin Lugar Anti-Corruption Provision. <http://www.pwypusa.org/wp-content/uploads/2018/01/Global-Witness-opposition-to-H.R.-4519-December-12-2017-1.pdf>. Accessed: 2018-11-20.
- Global Witness (2018). Finding the Missing Millions: A Handbook on Turning Payment to Government Transparency into Revenue Accountability.
- Graham, J. R., M. Hanlon, T. Shevlin, and N. Shroff (2013). Incentives for tax planning and avoidance: Evidence from the field. *The Accounting Review* 89(3), 991–1023.
- Granja, J. (2018). Disclosure Regulation in the Commercial Banking Industry: Lessons from the National Banking Era. *Journal of Accounting Research* 56(1), 173–216.
- Hanlon, M. and J. Slemrod (2009). What does tax aggressiveness signal? evidence from stock price reactions to news about tax shelter involvement. *Journal of Public Economics* 93(1-2), 126–141.
- Healy, P. and G. Serafeim (2017). Voluntary, Self-Regulatory and Mandatory Disclosure of Oil and Gas Company Payments to Foreign Governments. *Working Paper, Harvard University*.
- Hines, J. R. J. (1995). Forbidden Payment: Foreign Bribery and American Business After 1977. *NBER Working Paper No. 5266*.
- Ho, D. E., K. Imai, G. King, and E. A. Stuart (2007). Matching as Nonparametric Pre-processing for Reducing Model Dependence in Parametric Causal Inference. *Political Analysis* 15(3), 199–236.
- Hombach, K. and T. Sellhorn (2018). Firm Value Effects of Targeted Disclosure Regulation: The Role of Reputational Costs. *Working Paper, Frankfurt School of Finance and Management and University of Munich*, 1–68.
- Hoopes, J. L., L. Robinson, and J. Slemrod (2018). Public Tax-Return Disclosure. *Journal of Accounting and Economics* 66(1), 142–162.
- Hsieh, C.-T. and P. J. Klenow (2009). Misallocation and Manufacturing TFP in China and India. *Quarterly Journal of Economics* 124(4), 1403–1448.

- Humphreys, M., J. D. Sachs, and J. E. Stiglitz (2007). *Escaping the Resource Curse*. Columbia University Press.
- Iacus, S. M., G. King, and G. Porro (2012). Causal Inference without Balance Checking: Coarsened Exact Matching. *Political Analysis* 20(1), 1–24.
- Jin, G. Z. and P. Leslie (2003). The Effect of Information on Product Quality: Evidence from Restaurant Hygiene Grade Cards. *Quarterly Journal of Economics* 118(2), 409–451.
- Johannesen, N. and D. T. Larsen (2016). The Power of Financial Transparency: An Event Study of Country-by-Country Reporting Standards. *Economics Letters* 145, 120–122.
- Joshi, P. (2018). Does Private Country-by-Country Reporting Deter Tax Avoidance & Income Shifting? Evidence from BEPS Action Item 13. *Working Paper, York University*, 1–68.
- Joshi, P., E. Outslay, and A. Persson (2018). Does Public Country-by-Country Reporting Deter Tax Avoidance and Income-Shifting? Evidence from Capital Requirements Directive IV. *Working Paper, York University and Michigan State University*, 1–67.
- Kanodia, C. (2006). Accounting Disclosure and Real Effects. *Foundations and Trends in Accounting* 1(3), 167–258.
- Kanodia, C. and H. Sapra (2016). A Real Effects Perspective to Accounting Measurement and Disclosure: Implications and Insights for Future Research. *Journal of Accounting Research* 54(2), 623–676.
- Leuz, C. and P. D. Wysocki (2016). The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. *Journal of Accounting Research* 54(2), 525–622.
- Miller, G. S. (2006). The Press as a Watchdog for Accounting Fraud. *Journal of Accounting Research* 44(5), 1001–1033.
- Mills, L. F. (1998). Book-Tax Differences and Internal Revenue Service Adjustments. *Journal of Accounting Research* 36(2), 343–356.
- Mulherin, H. J. (2007). Measuring the Costs and Benefits of Regulation: Conceptual Issues in Securities Markets. *Journal of Corporate Finance* 13(2-3), 421–437.
- Natural Resource Governance Institute (2017). Twelve Red Flags. <https://resourcegovernance.org/analysis-tools/publications>. Accessed: 2017-07-28.
- Natural Resources Canada (2014). Extractive Sector Transparency Measures Act.
- New York Times (2016). Under Rex Tillerson, Exxon Mobil Forged Its Own Path Abroad. <https://www.nytimes.com/2016/12/13/world/americasresourcegovernan>. Accessed: 2017-06-17.
- OECD (2011). Convention on Combating Bribery of Foreign Public Officials in International Business Transactions. Accessed: 2018-11-16.

- OECD (2014). Foreign Bribery Report: An Analysis of the Crime of Bribery of Foreign Public Officials. <http://www.oecd.org/corruption/oecd-foreign-bribery-report-9789264226616-en.htm>. Accessed: 2018-11-16.
- OECD (2016). Corruption in the Extractive Value Chain. <http://www.oecd.org/dev/Corruption-in-the-extractive-value-chain.pdf>. Accessed: 2019-02-14.
- Open Oil (2012). Oil Contracts - How to Read and Understand Them. Available at: <http://openoil.net/understanding-oil-contracts/>. Accessed: 2017-09-06.
- Overesch, M. and H. Wolff (2018). Financial Transparency to the Rescue: Effects of Country-by-Country Reporting in the EU Banking Sector on Tax Avoidance. *Working Paper, University of Cologne*.
- Peress, J. (2014). The Media and the Diffusion of Information in Financial Markets: Evidence from Newspaper Strikes. *Journal of Finance* 69(5), 2007–2043.
- Petersen, M. A. (2009). Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. *Review of Financial Studies* 22(1), 435–480.
- Publish What You Pay (2017). Vote No on H.R. 4519 which would repeal the Cardin Lugar Anti-Corruption Provision. <http://www.pwypusa.org/wp-content/uploads/2017/12/PWYP-US-Letter-Responding-to-HR-4519-December-2017.pdf>. Accessed: 2018-11-20.
- Resource Contracts (2014). Mining Contracts - How to Read and Understand Them. Available at: <http://www.resourcecontracts.org/page/resources>. Accessed: 2017-09-06.
- Roberts, M. R. and T. M. Whited (2012). Endogeneity in Empirical Corporate Finance. *Handbook of the Economics of Finance* 2.
- Roychowdhury, S., N. Shroff, and R. S. Verdi (2018). The Effects of Financial Reporting and Disclosure on Corporate Investment: A Review. *Working Paper, Boston College and Massachusetts Institute of Technology*, 1–77.
- Shleifer, A. and R. W. Vishny (1993). Corruption. *Quarterly Journal of Economics* 108(3), 599–617.
- Shroff, N., R. S. Verdi, and G. Yu (2014). Information Environment and the Investment Decisions of Multinational Corporations. *The Accounting Review*, 759–790.
- Stein, J. C. (1997). Internal Capital Markets and the Competition for Corporate Resources. *Journal of Finance* 52(1), 111–133.
- Svensson, J. (2003). Who Must Pay Bribes and How Much? Evidence from a Cross Section of Firms. *Quarterly Journal of Economics* 118(1), 207–230.
- Tetlock, P. C. (2015). *The Role of Media in Finance*. North-Holland.

The Telegraph (2010). Gulf of Mexico Oil Spill: BP Faces Growing Calls for Boycott of its US Products .
<http://www.telegraph.co.uk/finance/newsbysector/energy/oilandgas/7742471/Gulf-of-Mexico-oil-spill-BP-faces-growing-calls-for-boycott-of-its-US-products.html>. Accessed: 2017-07-25.

Transparency International (2014). Exporting Corruption.
<https://www.transparency.org/whatwedo/publication>. Accessed: 2018-11-16.

United Nations (2015). Track It! Stop It! Get It! Report of the High Level Panel on Illicit Financial Flows from Africa. <https://www.uneca.org/publications/illicit-financial-flows>. Accessed: 2018-11-18.

Zeume, S. (2017). Bribes and Firm Value. *Review of Financial Studies* 30(5), 1457–1489.

Tables and Figures

Table 1: Implementation Details of Extraction Payment Disclosures

This table provides implementation details of EPD regulation across Europe and Canada. The *EPD Entry-Into-Force Date* indicates when the disclosure regulation was transposed into national law. *Applicable for Fiscal Years Starting on/after* is the first fiscal year in which extraction payment disclosures became effective for oil, gas, and mining companies in the respective country (* in Greece, EPD reports became effective for fiscal years *ending* on/after July 07, 2016; ** in Cyprus and Ireland, EPD regulation applied *retroactively* for financial years starting on/after Jan 01, 2016 and Jan 01, 2017, respectively). I obtain entry-into-force dates from the European Commission, the Canadian Ministry of Natural Resources, and federal law gazettes.

Country	EPD Entry-Into- Force Date	Applicable for Fiscal Years Starting on/after
Austria	Jul 20, 2015	Jan 01, 2016
Belgium	Jan 01, 2016	Jan 01, 2016
Bulgaria	Jan 01, 2016	Jan 01, 2016
Canada	Jun 01, 2015	Jun 01, 2015
Croatia	Jan 01, 2016	Jan 01, 2016
Cyprus**	Sep 23, 2016	Jan 01, 2016
Czech Republic	Jan 01, 2016	Jan 01, 2016
Denmark	Jul 01, 2015	Jan 01, 2016
Estonia	Jan 01, 2016	Jan 01, 2016
Finland	Jan 01, 2016	Jan 01, 2016
France	Dec 31, 2014	Jan 01, 2015
Germany	Jul 23, 2015	Jan 01, 2016
Greece*	Jul 07, 2016	Jul 07, 2016
Hungary	Jan 01, 2016	Jan 01, 2016
Iceland	Oct 30, 2015	Jan 01, 2016
Ireland**	Jun 09, 2017	Jan 01, 2017
Italy	Jan 01, 2016	Jan 01, 2016
Latvia	Jan 01, 2016	Jan 01, 2016
Liechtenstein	Oct 30, 2015	Jan 01, 2016
Lithuania	Jul 01, 2015	Jan 01, 2016
Luxembourg	Dec 28, 2015	Jan 01, 2016
Malta	Jan 01, 2016	Jan 01, 2016
Netherlands	Nov 10, 2015	Jan 01, 2016
Norway	Dec 05, 2013	Jan 01, 2014
Poland	Sep 23, 2015	Jan 01, 2016
Portugal	Jun 02, 2015	Jan 01, 2016
Romania	Jan 01, 2016	Jan 01, 2016
Slovakia	Jan 01, 2016	Jan 01, 2016
Slovenia	Aug 08, 2015	Jan 01, 2016
Spain	Jul 21, 2015	Jan 01, 2016
Sweden	Jan 01, 2016	Jan 01, 2016
United Kingdom	Dec 01, 2014	Jan 01, 2015

Table 2: EPD Adoption Characteristics of Disclosing Parent Firms

This table provides adoption characteristics of disclosing parent firms across my three main regression samples. Panel A summarizes the time-series variation in effective dates of EPD regulation for all treated firms. For each regression sample and effective year, I count the number of unique parent firms that provide extraction payment disclosures. *EPD Effective Year* indicates the first fiscal year in which extraction payment disclosures became effective for the respective oil, gas, and mining company. Panel B reports the number of unique disclosing parent firms by country of incorporation. I obtain the entry-into-force dates of EPD regulation from the European Commission, the Canadian Ministry of Natural Resources, and federal law gazettes.

Panel A: Time-Series Variation in Effective Dates of Extraction Payment Disclosures

EPD Effective Year	Number of Disclosing Parent Firms		
	Payment Analysis	Segment Investment Analysis	Consolidated Investment Analysis
2014	4	2	7
2015	17	17	63
2016	4	68	235
2017	0	1	3

Panel B: Disclosing Parent Firms by Country of Incorporation

EPD Country	Number of Disclosing Parent Firms		
	Payment Analysis	Segment Investment Analysis	Consolidated Investment Analysis
Austria	0	0	1
Canada	3	69	246
Cyprus	0	0	2
France	1	2	2
Germany	0	0	1
Ireland	0	0	1
Italy	1	0	0
Netherlands	0	0	1
Norway	3	2	3
Poland	0	0	3
Romania	0	1	1
Sweden	0	0	2
United Kingdom	17	14	45

Table 3: Descriptive Statistics

This table reports descriptive statistics for key variables of my empirical analysis. I report the number of observations (N), mean, standard deviation (SD), 10% quantile (p10), 25% quantile (p25), median (p50), 75% quantile (p75), and 90% quantile (p90). Panel A provides statistics for the variables used in my payment (gap) analysis, Panel B reports summary statistics for the variables used in my investment analysis at the geographic segment level, and Panel C reports descriptive statistics for the variables used in the consolidated investment analysis. *Extractive Payment/Total Assets_{t-1}* is the ratio of a firm's payments to a given host government in a given year divided by the company's lagged total assets. *Payment Gap/Extractive Payment* is the difference between the payments made by an extractive firm to a given host country in a given year and the corresponding payments officially received by the host government, divided by the former. *EPD* is an indicator variable equal to one beginning in the year in which EPD regulation becomes effective for the respective oil, gas, or mining company. *Ln(Total Assets_{t-1})* is the natural logarithm of the parent company's lagged total assets. *Return on Assets_{t-1}* is the parent company's lagged operating income before depreciation divided by the firm's total assets at the beginning of the period. *Leverage_{t-1}* is the lagged ratio of the parent company's long-term debt plus debt in current liabilities to total assets. *Corrupt Host Country* is an indicator variable equal to one if Transparency International assigned the host country a Corruption Perceptions Index of smaller than or equal to 25 in 2013. *Less Corrupt Host Country* is a dummy variable equal to one if Transparency International assigned the host country a Corruption Perceptions Index of larger than 25 in 2013. *Segment Capex/Total Assets_{t-1}* is equal to the firm's capital expenditures in the given host country divided by lagged total assets. *Parent Capex/Total Assets_{t-1}* is the ratio of the parent company's consolidated capital expenditures divided by lagged total assets. *EPD Effective* is an indicator variable equal to one during the period in which the given extractive firm is already subject to EPD regulation but did not publish a payment report yet. *EPD Published* is a dummy variable equal to one beginning in the period in which the firm publicly released its first extraction payment report. I obtain payment data from the Extractive Industries Transparency Initiative (EITI) and retrieve implementation dates of EPD regulation from the European Commission, the Canadian Ministry of Natural Resources, federal law gazettes, and firms' extraction payment disclosures. I download firm fundamentals from Compustat and Worldscope Geographic Segments and obtain the Corruption Perceptions Index from Transparency International.

Panel A: Variables used in Extractive Payment (Gap) Regressions

	N	Mean	SD	p10	p25	p50	p75	p90
Extractive Payment/Total Assets _{t-1} × 100	1013	2.316	7.657	0.000	0.002	0.107	1.216	5.683
Payment Gap/Extractive Payment × 100	552	9.204	19.792	0.000	0.000	0.201	7.997	30.412
EPD	1013	0.126	0.332	0.000	0.000	0.000	0.000	1.000
Ln(Total Assets _{t-1})	1013	9.075	2.666	5.219	7.347	9.780	11.344	12.091
Return on Assets _{t-1}	1013	0.102	0.158	-0.062	0.069	0.126	0.173	0.239
Leverage _{t-1}	1013	0.197	0.129	0.014	0.105	0.193	0.276	0.361
Corrupt Host Country	949	0.202	0.402	0.000	0.000	0.000	0.000	1.000
Less Corrupt Host Country	949	0.798	0.402	0.000	1.000	1.000	1.000	1.000

Panel B: Variables used in Segment Investment Analysis

	N	Mean	SD	p10	p25	p50	p75	p90
Segment Capex/Total Assets _{t-1} × 100	2686	2.737	2.824	0.003	0.232	1.736	4.587	7.421
EPD	2686	0.072	0.259	0.000	0.000	0.000	0.000	0.000
Ln(Total Assets _{t-1})	2686	19.701	1.987	17.204	18.243	19.512	21.100	22.447
Return on Assets _{t-1}	2686	-0.039	0.131	-0.207	-0.093	-0.012	0.045	0.094
Leverage _{t-1}	2686	0.484	0.878	0.000	0.000	0.110	0.445	1.735
Corrupt Host Country	2686	0.023	0.150	0.000	0.000	0.000	0.000	0.000
Less Corrupt Host Country	2686	0.977	0.150	1.000	1.000	1.000	1.000	1.000

Panel C: Variables used in Parent Investment Analysis

	N	Mean	SD	p10	p25	p50	p75	p90
Parent Capex/Total Assets _{t-1} × 100	47323	3.275	4.408	0.013	0.446	1.771	4.290	8.265
EPD	47323	0.049	0.217	0.000	0.000	0.000	0.000	0.000
EPD Effective	47323	0.028	0.166	0.000	0.000	0.000	0.000	0.000
EPD Published	47323	0.021	0.144	0.000	0.000	0.000	0.000	0.000
Ln(Total Assets _{t-1})	47323	3.919	2.908	0.520	1.909	3.674	5.936	7.831
Return on Assets _{t-1}	47323	-0.062	0.244	-0.176	-0.051	-0.010	0.022	0.048
Leverage _{t-1}	47323	0.545	1.588	0.027	0.079	0.279	0.529	0.785

Table 4: Effect of Extraction Payment Disclosures on Payments to Host Countries

This table reports the coefficients of OLS regressions investigating the effect of extraction payment disclosures on payments to foreign host governments by European and Canadian oil, gas, or mining companies (equation (1)). The dependent variable *Extractive Payment/Total Assets_{t-1}* equals the firm's payments to a given host government in a given year, divided by the company's lagged total assets. The key explanatory variable *EPD* is an indicator equal to one beginning in the year in which EPD regulation becomes effective for the respective oil, gas, or mining company. *Corrupt Host Country* is an indicator variable equal to one if Transparency International assigned the host country a Corruption Perceptions Index of smaller than or equal to 25 in 2013. *Less Corrupt Host Country* is a dummy variable equal to one if Transparency International assigned the host country a Corruption Perceptions Index of larger than 25 in 2013. $\ln(\text{Total Assets}_{t-1})$ is the natural logarithm of the firm's lagged total assets. *Return on Assets_{t-1}* is the company's lagged operating income before depreciation divided by the firm's total assets at the beginning of the period. *Leverage_{t-1}* is the lagged ratio of the firm's long-term debt plus debt in current liabilities to total assets. All specifications include host country-by-year, resource type-by-year (where resource types are defined using the 3-digit NAICS code), treatment or control group-by-year, and subsidiary fixed effects. T-statistics, reported in parentheses, are based on standard errors clustered at the level of the parent company's headquarter country (33 clusters). ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
<i>Dependent Variable:</i>	All	Including	Corrupt vs. Less
Extractive Payment/Total Assets _{t-1} × 100	Firms	Controls	Corrupt Host Countries
EPD	1.969* (1.76)	2.022** (2.18)	
EPD × Corrupt Host Country			5.942*** (2.82)
EPD × Less Corrupt Host Country			2.206* (1.78)
<i>Control Variables:</i>			
$\ln(\text{Total Assets}_{t-1})$		-1.854** (-2.47)	-1.615** (-2.46)
Return on Assets _{t-1}		-3.312*** (-3.37)	-3.547*** (-3.62)
Leverage _{t-1}		1.954 (0.58)	1.158 (0.34)
Observations	1,013	1,013	949
Adjusted R-Squared	0.828	0.838	0.842
Difference in EPD Coefficients (p-value)	-	-	0.003
<i>Fixed Effects:</i>			
Host Country × Year	Yes	Yes	Yes
Resource Type × Year	Yes	Yes	Yes
Treatment or Control Group × Year	Yes	Yes	Yes
Firm-Subsidiary	Yes	Yes	Yes

Table 5: Effect on Extractive Revenue Embezzlement by Host Country Officials

This table reports the coefficients of OLS regressions investigating the effect of extraction payment disclosures on payment gaps (equation (2)). The dependent variable *Payment Gap/Extractive Payment* is the difference between the payments made by an extractive firm to a given host country in a given year and the corresponding payments officially received by the host government, divided by the former. *Corrupt Host Country* is an indicator variable equal to one if Transparency International assigned the host country a Corruption Perceptions Index of smaller than or equal to 25 in 2013. *Less Corrupt Host Country* is a dummy variable equal to one if Transparency International assigned the host country a Corruption Perceptions Index of larger than 25 in 2013. $\ln(\text{Total Assets}_{t-1})$ is the natural logarithm of the firm's lagged total assets. *Return on Assets_{t-1}* is the company's lagged operating income before depreciation divided by the firm's total assets at the beginning of the period. *Leverage_{t-1}* is the lagged ratio of the firm's long-term debt plus debt in current liabilities to total assets. All specifications include host country-by-year, resource type-by-year (where resource types are defined using the 3-digit NAICS code), treatment or control group-by-year, and subsidiary fixed effects. T-statistics, reported in parentheses, are based on standard errors clustered at the level of the parent company's headquarter country (31 clusters). ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
<i>Dependent Variable:</i>	All	Including	Corrupt vs. Less
Payment Gap/Extractive Payment \times 100:	Firms	Controls	Corrupt Host Countries
EPD	-9.404*	-10.445**	
	(-1.96)	(-2.31)	
EPD \times Corrupt Host Country			-24.244***
			(-5.66)
EPD \times Less Corrupt Host Country			-8.550**
			(-2.43)
<i>Control Variables:</i>			
$\ln(\text{Total Assets}_{t-1})$		-3.255**	-3.215***
		(-2.39)	(-3.05)
Return on Assets _{t-1}		-0.447	-4.661
		(-0.02)	(-0.26)
Leverage _{t-1}		40.150**	50.146***
		(2.26)	(3.31)
Observations	512	512	478
Adjusted R-Squared	0.390	0.397	0.390
Difference in EPD Coefficients (p-value)	-	-	0.001
<i>Fixed Effects:</i>			
Host Country \times Year	Yes	Yes	Yes
Resource Type \times Year	Yes	Yes	Yes
Treatment or Control Group \times Year	Yes	Yes	Yes
Firm-Subsidiary	Yes	Yes	Yes

Table 6: Effect of Extraction Payment Disclosures on Segment Investments

This table reports the coefficients of OLS regressions investigating the effect of extraction payment disclosures on geographic segment investments by European and Canadian oil, gas, or mining companies (equation (3)). The dependent variable $Segment\ Capex/Total\ Assets_{t-1}$ is the firm's capital expenditures in a given host country, divided by lagged total assets. The key explanatory variable EPD is an indicator equal to one beginning in the year in which EPD regulation becomes effective for the respective oil, gas, or mining company. *Corrupt Host Country* is an indicator variable equal to one if Transparency International assigned the host country a Corruption Perceptions Index of smaller than or equal to 25 in 2013. *Less Corrupt Host Country* is a dummy variable equal to one if Transparency International assigned the host country a Corruption Perceptions Index of larger than 25 in 2013. $Ln(Total\ Assets_{t-1})$ is the natural logarithm of the firm's lagged total assets. $Return\ on\ Assets_{t-1}$ is the company's lagged operating income before depreciation divided by the firm's total assets at the beginning of the period. $Leverage_{t-1}$ is the lagged ratio of the firm's long-term debt plus debt in current liabilities to total assets. All specifications include host country-by-year, resource type-by-year (where resource types are defined using the 3-digit NAICS code), treatment or control group-by-year, and subsidiary fixed effects. T-statistics, reported in parentheses, are based on standard errors clustered at the level of the parent company's headquarter country (50 clusters). ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
<i>Dependent Variable:</i>	All	Including	Corrupt vs. Less
Segment Capex/Total Assets _{t-1} × 100	Firms	Controls	Corrupt Host Countries
EPD	-0.776** (-2.40)	-0.712** (-2.14)	
EPD × Corrupt Host Country			-1.448*** (-3.18)
EPD × Less Corrupt Host Country			-0.673* (-1.95)
<i>Control Variables:</i>			
Ln(Total Assets _{t-1})		-0.083 (-0.37)	-0.082 (-0.37)
Return on Assets _{t-1}		0.809** (2.61)	0.794** (2.54)
Leverage _{t-1}		-0.174 (-0.95)	-0.176 (-0.97)
Observations	2,686	2,686	2,686
Adjusted R-Squared	0.533	0.533	0.533
Difference in EPD Coefficients (p-value)	-	-	0.078
<i>Fixed Effects:</i>			
Host Country × Year	Yes	Yes	Yes
Resource Type × Year	Yes	Yes	Yes
Treatment or Control Group × Year	Yes	Yes	Yes
Firm-Subsidiary	Yes	Yes	Yes

Table 7: EPD Reports and Investments – Within Parent Country-Quarter Analysis

This table reports the coefficients of OLS regressions investigating the effect of extraction payment disclosures on consolidated investments by European and Canadian oil, gas, or mining companies (equation (4)). The dependent variable $Parent\ Capex/Total\ Assets_{t-1}$ is defined as the firm's consolidated capital expenditures, divided by lagged total assets. The key explanatory variable EPD is an indicator equal to one beginning in the quarter in which EPD regulation becomes effective for the respective oil, gas, or mining company. $EPD\ Effective$ is an indicator variable equal to one during the period in which the given extractive firm is already subject to EPD regulation but did not publish a payment report yet. $EPD\ Published$ is a dummy variable equal to one beginning in the period in which the firm publicly released its first extraction payment report. $Ln(Total\ Assets_{t-1})$ is the natural logarithm of the firm's lagged total assets. $Return\ on\ Assets_{t-1}$ is the company's lagged operating income before depreciation divided by the firm's total assets at the beginning of the period. $Leverage_{t-1}$ is the lagged ratio of the firm's long-term debt plus debt in current liabilities to total assets. All specifications include parent country-by-year, resource type-by-year (where resource types are defined using the 3-digit NAICS code), treatment or control group-by-year, and parent/firm fixed effects. T-statistics, reported in parentheses, are based on standard errors clustered at the level of the parent company's headquarter country (24 clusters). ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
<i>Dependent Variable:</i>	All	Including	Coarsened	Effective vs.
Parent Capex/Total Assets _{t-1} × 100	Firms	Controls	Exact Matched	Published
EPD	-0.341*** (-5.79)	-0.368*** (-6.28)	-0.577*** (-5.70)	
EPD Effective				-0.366*** (-5.64)
EPD Published				-0.589*** (-5.32)
<i>Control Variables:</i>				
Ln(Total Assets _{t-1})		-0.252 (-1.46)	-0.292* (-1.93)	-0.253 (-1.46)
Return on Assets _{t-1}		-0.245 (-1.24)	-0.233 (-1.03)	-0.246 (-1.25)
Leverage _{t-1}		-0.088*** (-3.47)	-0.150*** (-5.28)	-0.088*** (-3.47)
Observations	47,323	47,323	45,513	47,323
Adjusted R-Squared	0.356	0.358	0.379	0.358
Difference in EPD Coefficients (p-value)	-	-	-	0.051
<i>Fixed Effects:</i>				
Parent/Firm Country × Quarter	Yes	Yes	Yes	Yes
Resource Type × Quarter	Yes	Yes	Yes	Yes
Treatment or Control Group × Quarter	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes

Table 8: Public Shaming Channel

This table reports the coefficients of OLS regressions investigating the public shaming channel behind the effects of EPD regulation on extractive payments and segment investments. The dependent variable in columns (1) to (3) is the firm's payments to a given host government in a given year, divided by the company's lagged total assets (*Extractive Payment/Total Assets_{t-1}*). The outcome variable in columns (4) to (6) is the firm's capital expenditures in a given host country, divided by lagged total assets (*Segment Capex/Total Assets_{t-1}*). *EPD* is an indicator variable equal to one beginning in the year in which EPD regulation becomes effective for the respective oil, gas, or mining company. *(Never) Target of NGO Shaming Campaign* is a dummy variable equal to one if the company was (never) target of a NGO shaming campaign before EPD regulation came into force. *High (Low) Media Coverage* is an indicator variable equal to one if the company's average number of media articles per year was higher (lower) than the 75th percentile across all firms before the adoption of extraction payment disclosures. *Direct-to-Consumer (Wholesale) Market* is an indicator variable equal to one if the extractive firm sells its products directly to end consumers (via wholesale channels to other businesses). I manually collect data on the targets of all extractive sector campaigns by the world's 9 largest activist groups since 2000, obtain press coverage data from Factiva, and retrieve information about firms' main distribution channel from annual filings. All specifications include parent company controls and host country-by-year, resource type-by-year (where resource types are defined using the 3-digit NAICS code), treatment or control group-by-year, as well as subsidiary fixed effects. T-statistics, reported in parentheses, are based on standard errors clustered at the level of the parent company's headquarter country (33 clusters in columns (1) to (3) and 50 clusters in columns (4) to (6)). ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Dependent Variable</i> ($\times 100$):	Extractive Payment/Total Assets _{t-1}			Segment Capex/Total Assets _{t-1}		
EPD \times Target of NGO Shaming Campaign	2.527** (2.21)			-1.479*** (-3.23)		
EPD \times Never Target of NGO Shaming Campaign	1.609* (1.74)			-0.650* (-1.88)		
EPD \times High Media Coverage		2.381** (2.33)			-0.603** (-2.13)	
EPD \times Low Media Coverage		1.725* (1.87)			0.193 (0.63)	
EPD \times Direct-to-Consumer Market			2.266*** (2.89)			-2.140*** (-4.41)
EPD \times Wholesale Market			1.733 (1.23)			-0.596 (-1.61)
Observations	1,013	1,013	1,013	2,686	2,686	2,686
Adjusted R-Squared	0.838	0.838	0.838	0.533	0.533	0.533
Difference in EPD Coefficients (p-value)	0.019	0.050	0.683	0.026	0.009	0.036
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Host Country \times Year Fixed Effects (FE)	Yes	Yes	Yes	Yes	Yes	Yes
Resource Type \times Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Treatment or Control Group \times Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Subsidiary FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 9: Enforcement Channel

This table reports the coefficients of OLS regressions investigating the enforcement channel behind the effects of EPD regulation on extractive payments and segment investments. The dependent variable in column (1) is the firm's payments to a given host government in a given year, divided by the company's lagged total assets (*Extractive Payment/Total Assets_{t-1}*). The outcome variable in column (2) is the firm's capital expenditures in a given host country, divided by lagged total assets (*Segment Capex/Total Assets_{t-1}*). *EPD* is an indicator variable equal to one beginning in the year in which EPD regulation becomes effective for the respective oil, gas, or mining company. *Strong (Weak) Anti-Corruption Enforcement* is an indicator variable equal to one if Transparency International classifies the parent company's headquarter country as an active enforcer of the OECD Anti-Bribery Convention. I obtain enforcement data from the "Exporting Corruption" reports of Transparency International. All specifications include parent company controls and host country-by-year, resource type-by-year (where resource types are defined using the 3-digit NAICS code), treatment or control group-by-year, as well as subsidiary fixed effects. T-statistics, reported in parentheses, are based on standard errors clustered at the level of the parent company's headquarter country (33 clusters in column (1) and 50 clusters in column (2)). ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)
<i>Dependent Variable</i> ($\times 100$):	Extractive Payment/Total Assets _{t-1}	Segment Capex/Total Assets _{t-1}
EPD \times Strong Anti-Corruption Enforcement	2.197* (1.87)	-1.048*** (-2.92)
EPD \times Weak Anti-Corruption Enforcement	1.606** (2.43)	-0.512 (-1.30)
Observations	1,013	2,686
Adjusted R-Squared	0.838	0.533
Difference in EPD Coefficients (p-value)	0.350	0.143
Control Variables	Yes	Yes
Host Country \times Year Fixed Effects (FE)	Yes	Yes
Resource Type \times Year FE	Yes	Yes
Treatment or Control Group \times Year FE	Yes	Yes
Firm-Subsidiary FE	Yes	Yes

Figure 1: Identification Strategy

This figure illustrates the identification strategy of my baseline payment and investment analyses (equations (1) to (3)). I employ a generalized difference-in-differences design based on the staggered adoption of extraction payment disclosures across Europe and Canada. Each of my host countries covers payment and investment data from European, North American, Australian, Chinese, and other multinational extractive companies on a subsidiary - host country - year level. Given the staggered and quasi-exogenous implementation of extraction payment disclosures, different foreign subsidiaries of disclosing extractive firms get treated at different points in time. My dependent variable is the (normalized) amount of extractive payments or segment investments. I fix the host country, year, and natural resource that is extracted. I then compare the change in payments or capital expenditures by subsidiaries whose parent companies become subject to EPD regulation before and after with the corresponding payment or investment change of subsidiaries whose parents are not (yet) affected by the disclosure regulation. For example, Statoil, the largest Norwegian oil and gas company, became subject to EPD regulation in 2014. For Shell the disclosure regulation only became effective in 2015. Chevron is never treated and forms part of the non-disclosing control group since the United States did not implement extraction payment disclosures.

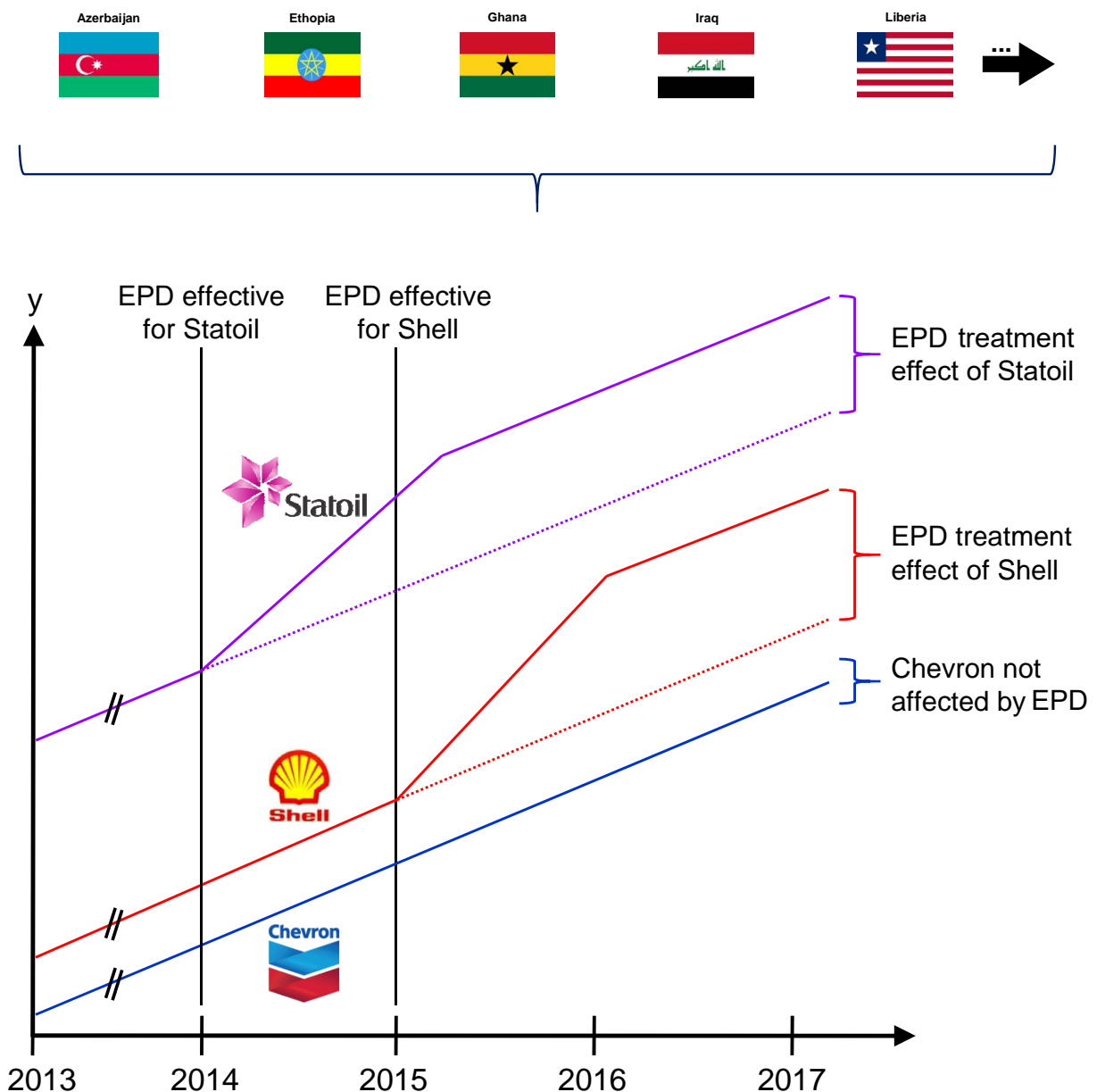


Figure 2: Extractive Payment Patterns of Disclosing Firms in Event Time

This figure reports the coefficients of OLS regressions investigating the effect of extraction payment disclosures on payments to foreign host governments in event time. I estimate equation (1) but replace the *EPD* indicator variable with 4 separate dummies, each marking one time period relative to the entry-into-force year ($t=0$). I omit the indicator for year $t-1$, which serves as the benchmark period with an OLS coefficient and standard error of zero. Vertical bands represent 95% confidence intervals for the point estimates in each time period.

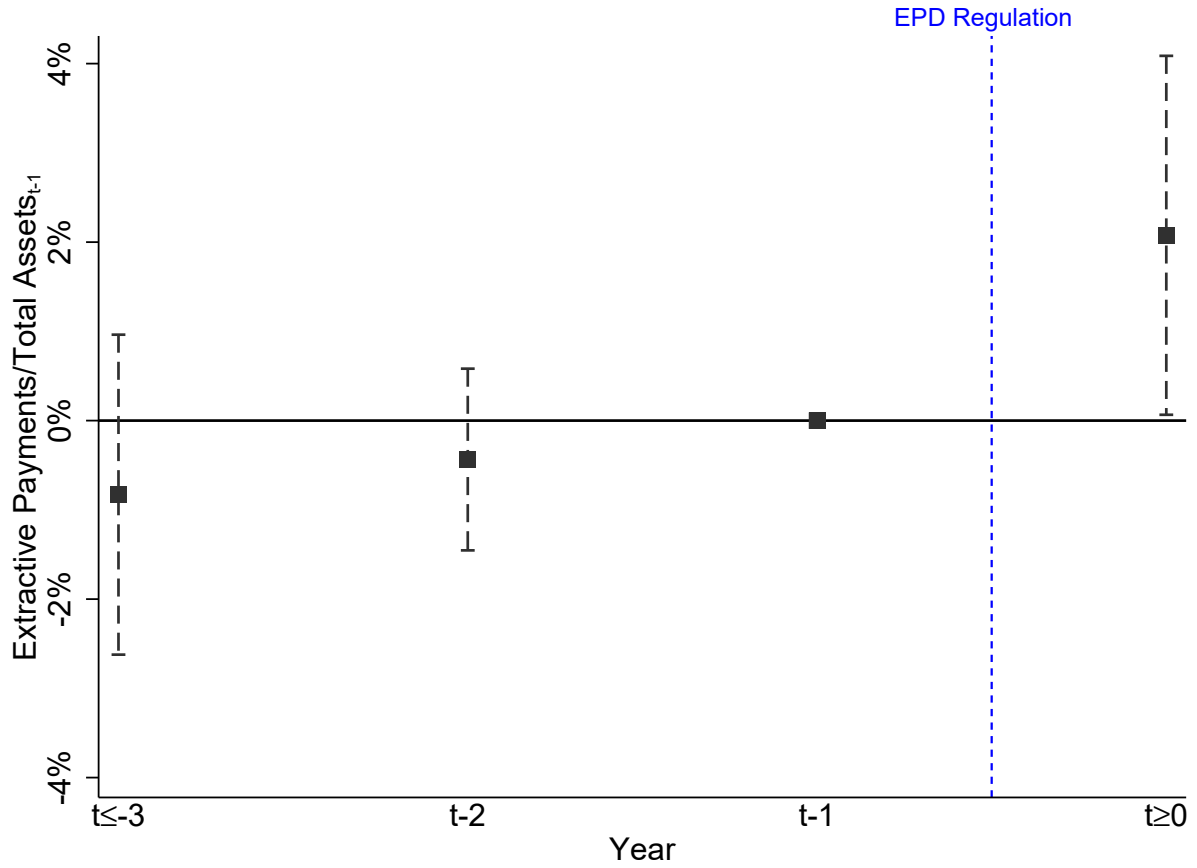


Figure 3: Payment Gaps in Event Time

This figure reports the coefficients of OLS regressions investigating the effect of extraction payment disclosures on payment gaps in event time. Payment gaps are a proxy for extractive revenue embezzlement by host country officials. I estimate equation (2) but replace the *EPD* indicator variable with 4 separate dummies, each marking one time period relative to the entry-into-force year ($t=0$). I omit the indicator for year $t-1$, which serves as the benchmark period with an OLS coefficient and standard error of zero. Vertical bands represent 95% confidence intervals for the point estimates in each time period.

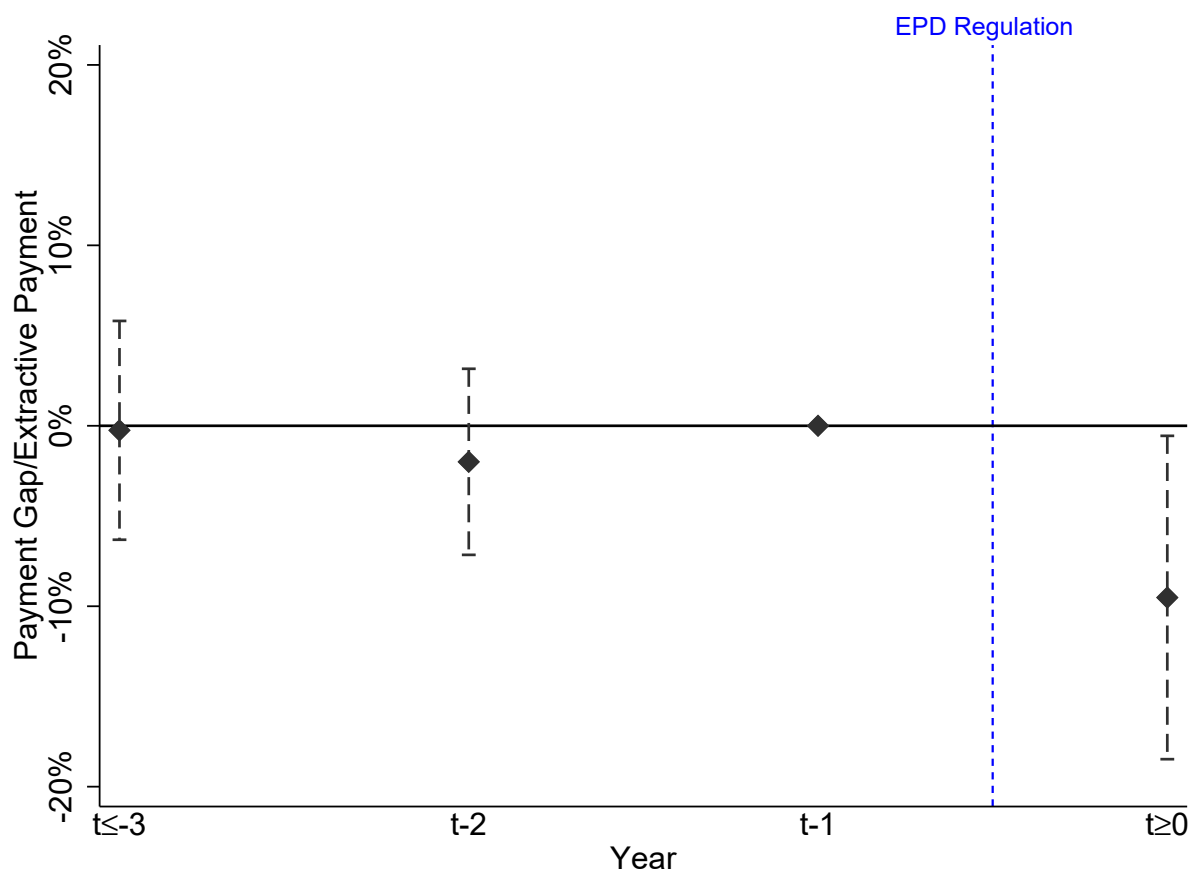


Figure 4: Investment Patterns of Disclosing Firms in Event Time

This figure reports the coefficients of OLS regressions investigating the effect of extraction payment disclosures on segment-level investments in event time. I estimate equation (3) but replace the *EPD* indicator variable with 7 separate dummies, each marking one time period relative to the entry-into-force year ($t=0$). I omit the indicator for period $t-1$, which serves as the benchmark period with an OLS coefficient and standard error of zero. Vertical bands represent 95% confidence intervals for the point estimates in each time period.

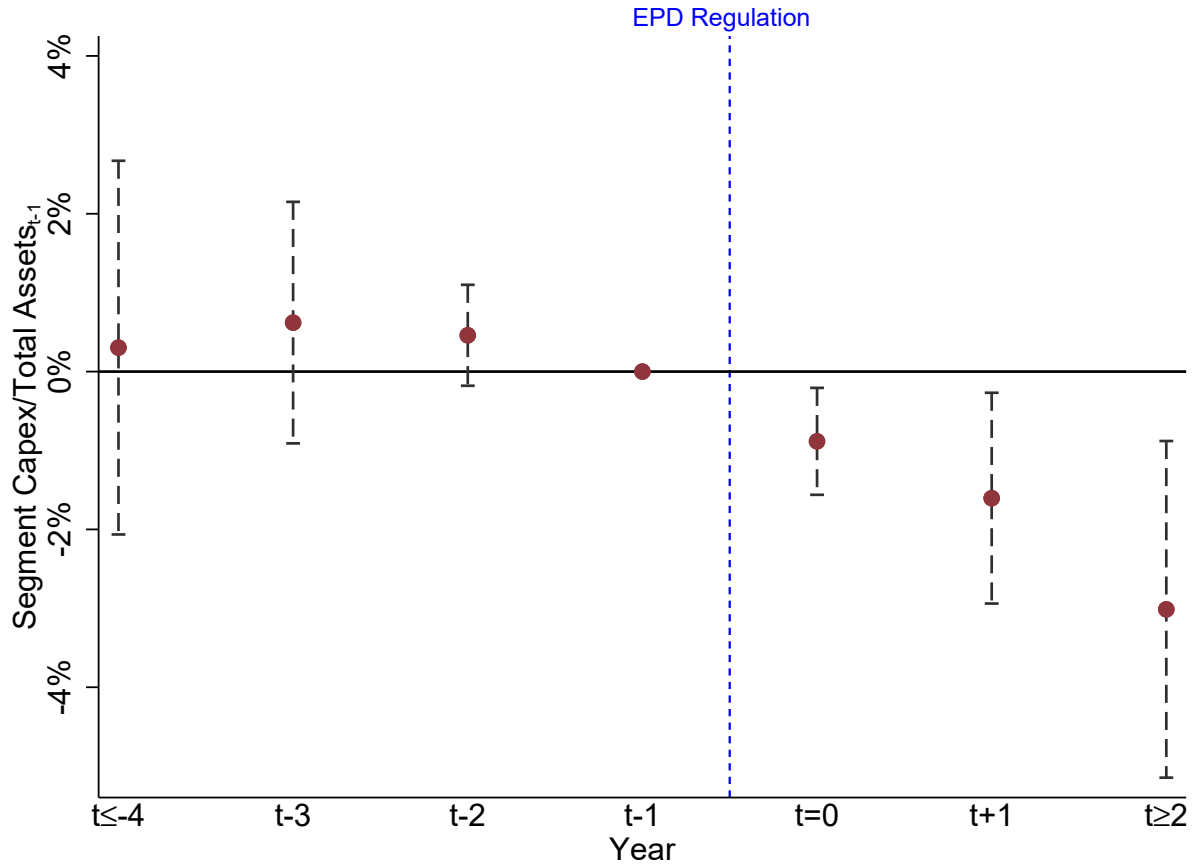
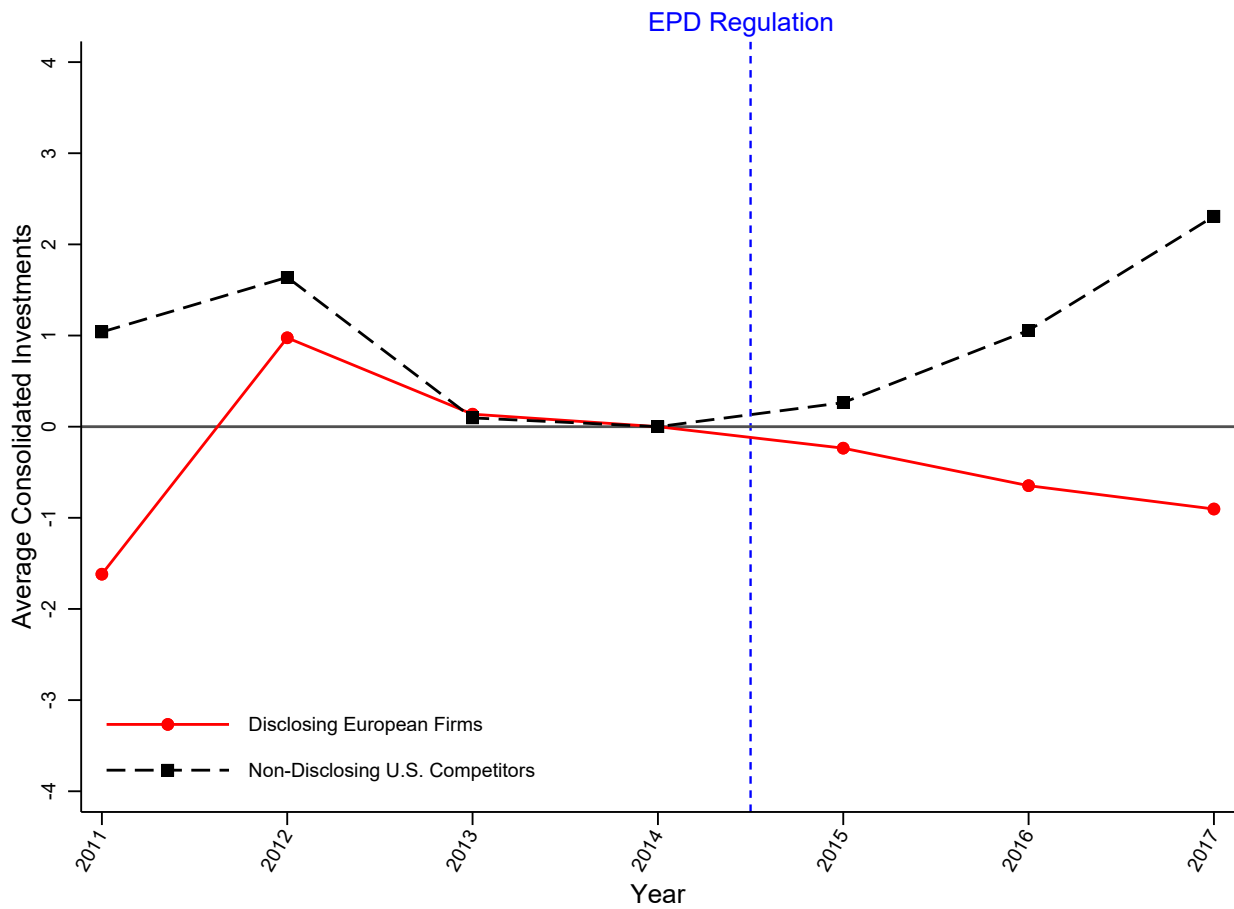


Figure 5: Capital Reallocation from Disclosing Firms to Non-Disclosing Competitors

This figure illustrates that extraction payment disclosures trigger capital reallocations across firms from disclosing European companies to non-disclosing U.S. competitors. I plot the average residualized capital expenditures from equation (4) for both types of companies on an annual basis. For ease of exposition, I also normalize average investments by subtracting the mean and dividing by the standard deviation of each group. In order to compare average capital expenditures within the same calendar year across treatment and control groups, I focus on investment changes around the year 2015.



Internet Appendix to

Disclosure Regulation, Corruption, and Investment:
Evidence from Natural Resource Extraction

February 21, 2019

Table of Contents

Internet Appendix A: Payment Information in EPD vs. EITI Reports

Internet Appendix B: Coarsened Exact Matching

Internet Appendix C: Robustness Tests and Extensions

Internet Appendix A: Payment Information in EPD vs. EITI Reports

Figure IA1: Payment Information before and after Extraction Payment Disclosures

This figure illustrates the type of publicly available payment information before and after EPD regulation. Panels A and B show parts of BP's extraction payment report for the financial year ended on 31 December 2015. Consistent with EPD regulation, BP disaggregates extractive payments by host country and payment type (Panel A). For each host country (e.g., Trinidad and Tobago) and payment type, BP has to additionally provide a payment break down by extractive project and receiving government institution (Panel B). Figures in both panels are reported in million USD. Panel C illustrates the coarser payment information available in EITI reports before (and after) the adoption of extraction payment disclosures. For example, Trinidad and Tobago's (TT) EITI report only disaggregates BP's extractive payments (to the host country) by subsidiary, but not by payment type, extractive project, or specific government institution (figures are reported in TT dollars). Overall, the payment information in extraction payment disclosures is substantially more detailed than in EITI reports, allowing activist groups and anti-corruption prosecutors to uncover payment discrepancies and exert pressure on disclosing firms ([Global Witness \(2018\)](#)).

Panel A: Granular Payment Disaggregation in EPD Reports by Host Country and Payment Type

Country	Production Entitlements	Taxes	Royalties	Fees	Bonuses	Infrastructure Improvements	Total
Algeria		134.0					134.0
Angola	1,985.9	641.2		0.4	48.3	0.5	2,676.4
Argentina		0.2					0.2
Australia		71.1	129.9				201.0
Azerbaijan	8,019.1	237.5		2.1			8,258.8
Brazil				187.7			187.7
Canada		1.5	0.4	0.7			2.6
Egypt		348.1		0.2	5.7		353.9
India	2.1	21.0					23.1
Indonesia	550.8	333.8		1.2			885.9
Iraq		59.0		2.1		6.6	67.7
Libya				0.6			0.6
Norway		6.8		9.6			16.3
Oman				0.4		25.1	25.5
Qatar		0.8					0.8
Russia		34.0					34.0
Trinidad and Tobago		407.6	129.6	2.6			539.9
United Arab Emirates		1,060.1					1,060.1
United Kingdom		(317.6)		7.8			(309.8)
United States	33.2	138.0	764.6	22.8	4.9		963.4
Uruguay				0.3			0.3
Venezuela		0.2					0.2
Vietnam		75.5					75.5
Total	10,591.2	3,252.8	1,024.5	238.5	58.8	32.3	15,198.0

Panel B: Granular Payment Disaggregation in EPD Reports by Project and Government Institution

TRINIDAD AND TOBAGO

\$ million

GOVERNMENTS	Production Entitlements	Taxes	Royalties	Fees	Bonuses	Infrastructure Improvements	Total
Board of Inland Revenue		387.1					387.1
Ministry of Energy & Energy Affairs		20.6	38.8	2.6			62.0
National Gas Company of Trinidad & Tobago Ltd			90.8 ^a				90.8
Total		407.6	129.6	2.6			539.9

PROJECTS	Production Entitlements	Taxes	Royalties	Fees	Bonuses	Infrastructure Improvements	Total
Block 5B				2.5			2.5
BPTT Blocks		407.6	129.6 ^a	0.2			537.5
Total		407.6	129.6	2.6			539.9

Panel C: Coarse Payment Disaggregation in EITI Reports by Extractive Firm and Subsidiary

Company	Adjusted total per Government	Adjusted total per company	Difference after adjustments
	TT\$	TT\$	TT\$
Amoco Trinidad Gas BV Trinidad Branch	28,313,870	28,313,931	(61)
BP Exploration Operating Co Ltd Trinidad Branch	56,959	56,959	-
BP Trinidad and Tobago LLC Trinidad Branch	4,427,618,484	4,452,299,889	(24,681,405)
BP Trinidad Processing Limited	54,212,919	54,212,919	-
BP Group	4,510,202,232	4,534,883,698	(24,681,466)

Internet Appendix B: Coarsened Exact Matching

Table IA1: Covariate Imbalances

This table reports covariate imbalances before and after coarsened exact matching (CEM) for the variables used in my consolidated investment analysis. The \mathcal{L}_1 distance measures the covariate imbalance between disclosing and non-disclosing firms based on financial characteristics before the adoption of extraction payment disclosures. \mathcal{L}_1 is bounded between zero and one and a lower value indicates a lower imbalance (Iacus et al. (2012)). I also report differences in the mean, minimum, 25% quantile (p25), median (p50), 75% quantile (p75), and maximum across treatment and control groups.

	\mathcal{L}_1 Distance	Δ Mean	Δ Min	Δ p25	Δ p50	Δ p75	Δ Max
<i>Before CEM:</i>							
Total Assets _{2013-Q4}	0.195	5226.089	0.000	18.277	163.280	1053.937	13347.537
Return on Assets _{2013-Q4}	0.228	0.004	0.000	0.000	0.000	0.017	-0.011
Leverage _{2013-Q4}	0.209	-0.145	0.000	0.041	0.139	0.021	-23.865
<i>After CEM:</i>							
Total Assets _{2013-Q4}	0.141	1933.204	0.000	16.625	149.354	624.993	13347.537
Return on Assets _{2013-Q4}	0.141	-0.000	0.000	0.000	0.000	-0.000	0.002
Leverage _{2013-Q4}	0.170	-0.010	0.000	0.029	0.040	-0.049	-0.687

Internet Appendix C: Robustness Tests and Extensions

Table IA2: Robustness Tests

This table reports coefficients of OLS regressions assessing the robustness of my baseline payment and investment results. I reestimate equations (1) and (3) but apply a variety of different sampling and research design choices (see Section 7). T-statistics, reported in parentheses, are based on standard errors clustered at the level of the parent company's headquarter country. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A	(1)	(2)	(3)	(4)	(5)
<i>Dependent Variable</i> ($\times 100$): Extractive Payment/Total Assets _{t-1}	Within Disclosing Firms	Excluding EPDs in Annual Reports	Finer Resource Type Definition	Winsorizing Dep. Variable	Foreign vs. Domestic
EPD	1.982*** (5.52)	2.301* (1.91)	2.082** (2.26)	1.904* (1.99)	
EPD \times Foreign Host Country					2.028** (2.27)
EPD \times Domestic Host Country					1.961 (0.99)
Observations	400	961	1,007	1,021	1,013
Adjusted R-Squared	0.725	0.838	0.728	0.914	0.838
Δ EPD Coefficients (p-value)	-	-	-	-	0.967
Control Variables	Yes	Yes	Yes	Yes	Yes
Host Country \times Year FE	Yes	Yes	Yes	Yes	Yes
Resource Type \times Year FE	Yes	Yes	Yes	Yes	Yes
Treatment or Control Group \times Year FE	No	Yes	Yes	Yes	Yes
Firm-Subsidiary FE	Yes	Yes	Yes	Yes	Yes

Panel B	(1)	(2)	(3)	(4)	(5)
<i>Dependent Variable</i> ($\times 100$): Segment Capex/Total Assets _{t-1}	Within Disclosing Firms	Excluding EPDs in Annual Reports	Finer Resource Type Definition	No Minimum Size Threshold	Foreign vs. Domestic
EPD	-0.589* (-2.15)	-0.639* (-1.92)	-0.765** (-2.41)	-0.651** (-2.04)	
EPD \times Foreign Host Country					-1.239*** (-4.20)
EPD \times Domestic Host Country					-0.187 (-0.44)
Observations	569	2,587	2,685	2,860	2,686
Adjusted R-Squared	0.582	0.532	0.541	0.523	0.534
Δ EPD Coefficients (p-value)	-	-	-	-	0.020
Control Variables	Yes	Yes	Yes	Yes	Yes
Host Country \times Year FE	No	Yes	Yes	Yes	Yes
Resource Type \times Year FE	Yes	Yes	Yes	Yes	Yes
Treatment or Control Group \times Year FE	No	Yes	Yes	Yes	Yes
Firm-Subsidiary FE	Yes	Yes	Yes	Yes	Yes