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Regression discontinuity evidence from the EU's tax haven listing process

Matthew Collin

Does the threat of being blacklisted change behavior? Regression discontinuity evidence from the EU's tax haven listing process

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Abstract

In late 2016, the EU Commission began a detailed review of over 80 non-European jurisdictions to determine how compliant they were with international standards around tax transparency, fair taxation and adherence to the OECD's Base Erosion Profit Shifting (BEPS) minimum standards. The EU subsequently published both a 'grey' and 'black' list of jurisdictions to promote their cooperation with these standards. I investigate the impact that this process has had on several measures of international tax governance by employing a regression discontinuity design derived from the unique process the EU used to select jurisdictions for review. I find that although jurisdictions selected into review were substantially more likely to be grey or blacklisted, detectable improvements in tax governance are largely limited to (i) increases in transparency around the presence and removal of harmful tax regimes and (ii) increases in the effective implementation of exchange-of-information (EOIR) agreements. However, countries selected into the EU process were significantly more likely to join the Inclusive Framework, a forum dedicated to implementing the BEPS minimum standards and deliberating over changes to international tax rules. Back-of-the-envelope estimates suggest that the Inclusive Framework is roughly 15% larger thanks to the EU review process, although its composition in terms of representation by developing countries or jurisdictions traditionally thought of as tax havens remains roughly the same.

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1 Introduction

There has been a rapid shift in global tax governance in the past decade. This has been prompted by a recognition that there are two significant externalities driving the movement of financial assets and profits to offshore financial centers (OFCs). The first is financial secrecy, provided by offshore jurisdictions to clients who are able to obscure their ownership and potentially avoid taxation. Studies estimate the amount of wealth being held in offshore tax havens to be approximately 8% of all household wealth or 10% of global GDP, a significant portion of which goes unreported (Zucman 2013; Johannesen et al. 2018). The second externality is a set of corporate tax policies - a combination of rates, loopholes and lack of transparency - that create incentives for multinational enterprises (MNEs) to shift their profits away from high tax jurisdictions to lower tax ones where there is little economic activity of substance. In a recent study, Tørsløv, Wier, and Zucman (2019) estimate that up to 40% of global MNE profits are shifted to tax havens.[1]

To collectively deal with these externalities, jurisdictions across the globe are in the process of committing to two separate OECD frameworks aimed at reducing international tax evasion and avoidance. The first of these is the OECD/G20 Base Erosion and Profit Shifting (BEPS) initiative, which is being taken forward by the international forum known as the Inclusive Framework (IF) on BEPS. The goal of the IF is to promote specific actions and standards that will help countries tackle tax planning efforts by multinationals which lead to an erosion of the corporate tax base. At the very least, members of the IF are expected to adopt four minimum standards, built around reducing harmful tax practices, combating tax treaty abuse, handling treaty disputes and arbitration and finally documenting transfer pricing. The last of these include country-by-country reporting (CbCr), the requirement for parent companies of multinationals to disclose significant details about their operations, profits and tax payments, which will then be exchanged between participating tax authorities. It should be noted that the BEPS Minimum Standards are only part of the entire package of reforms promoted by the OECD - and by themselves do not represent a sufficient set of policies for eliminating cross-border tax externalities. As of April 2020, 137 jurisdictions have joined the Inclusive Framework as members, committing to adopting its standards.

The second initiative is the adoption of the OECD's Common Reporting Standard (CRS) for the Automatic Exchange of Information (AEOI). Jurisdictions that adopt this standard will require financial institutions to report account information for non-resident taxpayers and for that information to be automatically exchanged between tax authorities in participating jurisdictions. Recent studies suggest that bilateral AEOI exchanges lead to a shift of offshore assets out of tax havens, although it is unclear how much of this

[1]The term tax haven is occasionally a contentious one, but they are generally thought of as jurisdictions that employ financial secrecy, low corporate tax rates, and/or preferential tax regimes to attract financial assets and investments from foreign entities and persons.

presumably untaxed wealth is repatriated (Beer, Coelho, and Leduc 2019; Casi, Spengel, and Stage 2019; O'Reilly, Ramirez, and Stemmer 2019; Menkhoff and Miethe 2019). Approximately 130 jurisdictions have committed to exchanging under CRS, over a third of which which began their first exchanges in 2017, another third in 2018 and the remaining third between 2019 and 2023. The CRS framework is seen as an improvement from an older system of information exchange, known as exchange-of-information on request (EOIR), where tax authorities must make active requests for information on specific taxpayers. Despite this, there are still efforts to ensure that EOIR is being adequately implemented, as jurisdictions are reviewed through the Global Forum on Transparency and Exchange of Information for Tax Purpose.

In late 2016, the EU Commission began a careful review of 80-90 non-European jurisdictions to determine how compliant they were with international standards around tax transparency, fair taxation and adherence to the OECD's Base Erosion Profit Shifting (BEPS) minimum standards. After the review and some dialogue with non-compliant countries, the EU released a 'grey' list of jurisdictions who were non-compliant with these standards, but had committed to make improvements, as well as a 'black' list of jurisdictions who were non-cooperative, who were to be subject to a number of EU countermeasures.

In this paper, I investigate the impact that this process has had on the standards that the EU intended to enforce. I rely on the process the EU used to select countries for consideration in its listing process to compare jurisdictions who scored just high enough to be considered with those that did not. Using a regression discontinuity specification, I find that countries that were selected into the EU's review process were substantially more likely to be grey or blacklisted, but that there is mixed evidence that, to date, the process has affected policy adoption. On average, index measures of global tax governance, based off of the EU's own goals, do not show large improvements. The main exception is for Fair Taxation, where jurisdictions selected by the EU saw a large increase in the probability that their tax regimes had been inspected by the EU or the OECD and, as of the time of writing, that they no longer had any harmful regimes present. There is weak evidence that the EU review process increased the the number of BEPS minimum standards adopted. There is also some evidence that the EU process led to a sharp increase in the probability that the Global Forum rated a jurisdiction as "largely compliant" or better on its implementation of EOIR.

The most robust and striking result from the analysis is the fact that countries selected into the process were substantially more likely to join the Inclusive Framework, thus committing themselves to implementing the BEPS minimum standards. This means that even if the EU review process has not improved international tax governance by much in the medium term, it might do so in the long term as these commitments become more binding. It also has implications for the future of deliberation over new international tax rules, as it shows that unilateral involvement of regional unions can influence participation in international standard setting. Using a difference-in-difference strategy, I show that,

on average, the EU review and listing process increased the probability of IF membership by approximately 30% for selected jurisdictions, translating into an increase in total IF membership by around 15%. While the composition of the IF is not radically different due to the EU's involvement, its impact on the participation of developing countries might have been stronger had it set lower thresholds for the review, or had it not excluded least developed countries (LDCs) from the review process.

The other result worth emphasizing is that the EU review process appears to have had positive spillovers on the probability a jurisdiction was reviewed by the OECD Forum on Harmful Tax Practices. This may have been driven purely by the fact that IF members are subject to these reviews, but indicates how unilateral efforts by one entity can have spillovers onto others. While I am unable to identify the net impact the EU review and listing process has had on the total number of harmful tax regimes that have been struck down, the results in this paper are consistent with the EU review process having a sizable impact.

This paper makes several contributions. First, it is the first rigorous test of the impact of the EU's efforts to improve tax governance worldwide. While it is easy to observe how countries included in the listing process have improved, we would not normally know how these countries would have improved without the EU's intervention, particularly because there is ongoing pressure from a multitude of institutions (e.g. the OECD, US Government, IMF, World Bank) to improve tax governance.

Second, this paper adds to a nascent empirical literature on the effect of listing exercises on institutional behavior and outcomes. For example, Morse (2019) shows that those added to the Financial Action Task Force (FATF)'s 'greylist' of countries that lack compliance with international anti-money laundering (AML) standards are significantly more likely to criminalize money laundering. Kelley and Simmons (2015) find that countries listed on the US State Department's annual Trafficking in Person's report are more likely to subsequently criminalize human trafficking. These empirical studies are backed up with case study evidence that jurisdictions are nudged into compliance by the threat of blacklisting (in both the space of AML/CFT and in tax transparency), even when there are no explicit sanctions (Sharman 2009).

The rest of the paper proceeds as follows: Section 2 discusses the recent history of the EU review and listing process. Section 3 discusses the empirical approach I take in this paper, Section 4 presents the main regression discontinuity results as well as results exploiting changes across time. Section 5 discusses the implications these results have for international tax governance as well as reasons the EU blacklisting process may not have a powerful effect on state behavior. I conclude the paper with Section 6.

2 The EU review and listing process

The EU made its first collective effort to enforce international tax standards in mid-2015, when it published a list of non-cooperative tax havens as part of its "Action Plan for Fair

and Efficient Corporate Taxation in the EU."[2] The list was presented as an amalgamation of the lists maintained by each of the EU member states: if a jurisdiction was present on ten or more lists of member states, it was included in the published annex of the Action Plan.

The publication of the consolidated list led to a substantial amount of furor among the included jurisdictions, many pointing out that because each EU member state used a different set of criteria for identifying tax havens, the composition of the final list was arbitrary (The Economist 2015). This led to both backpedalling and an argument over semantics, with the EU responding by insisting the list it published was not actually intended to be seen as a list, and the OECD noting that it was "unfortunate that the exercise has looked like the establishment of a list."[3] Several countries were subsequently removed from the list in October 2015 to reflect changes in underlying member state blacklisting.

The EU's 2015 list was quietly shuttered as the institution opted for a more systematic approach for creating a pan-European list.[4] As part of its efforts, the EU released a scoreboard of 160 non-European countries in September 2016.[5] The scoreboard, which is discussed in more detail in Section 3.2, was devised to determine which jurisdictions were at the greatest risk of facilitating tax avoidance, ranked them according to three criteria: (i) the strength of their economic ties to the EU, (ii) their overall financial activity, and (iii) a series of 'stability factors' including corruption and regulatory quality. Those jurisdictions which ranked high enough all three criteria were selected for further scrutiny, although some, such as those designated by the UN as Least Developed Countries, were excluded from the review process.

The EU performed a very basic assessment for the eighty-one selected jurisdictions to determine whether there were risks with respect to transparency, preferential tax regimes or low tax rates. Following this, the EU's Code of Conduct Group for Business Taxation (CCG) devised a set of criteria to screen jurisdictions for their adherence to international standards on tax transparency, fair taxation and anti-BEPS measures.[6] This screening took place during the first half of 2017, after which the CCG then communicated directly with jurisdictions found to have deficiencies, asking for commitments to improve their tax governance by the end of the following year. In early December 2017, jurisdictions which were not able to make a credible commitment were added to EU's first published "non-cooperative jurisdictions for tax purpose," referred from hereon as the blacklist. In addition to this, in an annex, the EU also publishes a list of the jurisdictions it is working with to improve their adherence to international standards, which I will call the EU's

[2] https://ec.europa.eu/taxation_customs/business/company-tax/action-plan-corporate-taxation_en

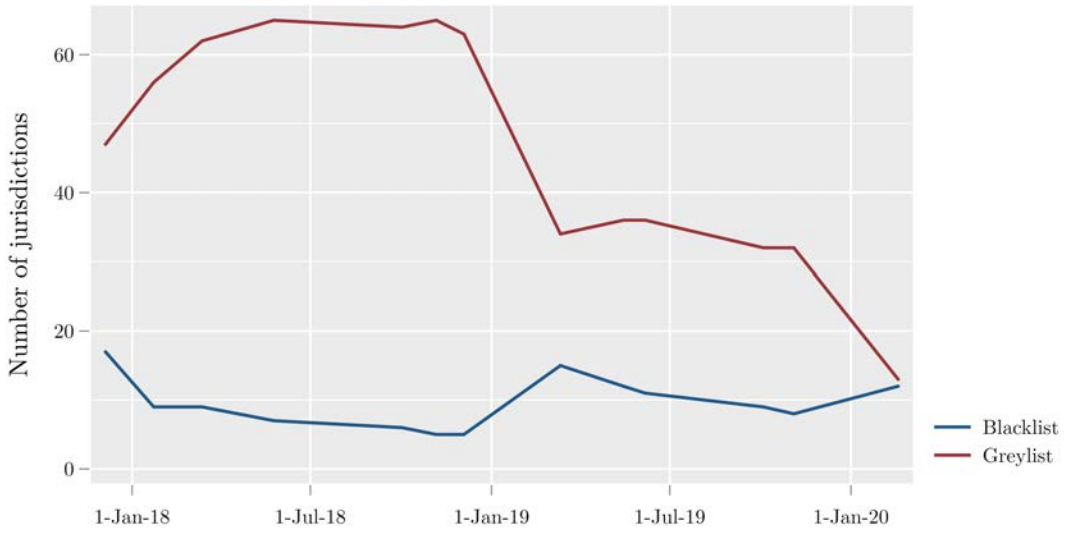
[3] https://www.oecd.org/tax/transparency/eucommissionsannouncementonnon-cooperativejurisdictionslettertoglob htm

[4] https://data.consilium.europa.eu/doc/document/ST-9452-2016-INIT/en/pdf

[5] https://ec.europa.eu/taxation_customs/sites/taxation/files/2016-09-15_scoreboard-indicators.pdf

[6] These criteria are discussed in detail in Table A5 in the Online Appendix and below in Section 3.4.

Figure 1: Evolution of the EU greylist and blacklist over time



Note: Figure shows number of jurisdictions currently on the EU's list of non-cooperative jurisdictions for tax purposes (the blacklist) and those listed in Annex II under "state of play of the cooperation with the EU with respect to commitments taken to implement tax good governance principles" (the greylist).

'grey list.'

Of the jurisdictions that were originally selected for the entire review and screening process, roughly 50% were included in the greylist in its first release and a further 15% were added to the blacklist. Figure 1 displays the number of countries listed on black and grey lists from December 2017 until February 2020. Over the course of 2018, the greylist swelled to over 60 jurisdictions as many jurisdictions committed to improving various tax governance outcomes, including several jurisdictions that successfully moved off of the black list. Many of these commitments were due in the 2019 calendar year, which led to a large reduction in jurisdictions on the greylist, some of whom moved to the blacklist due to continued noncompliance.

The EU CCD continues to review and update that list up until today. If greylisted jurisdictions take too long in this implementation, they face the risk of being added to the blacklist. Blacklisted jurisdictions are those who are considered to be both non-compliant and non-cooperative. For these countries a number of EU sanctions will apply, either now or at some unspecified point in the future: (i) funding from a variety of EU Funding Instruments cannot be channeled through entities in listed countries, (ii) tax schemes or multinational activities routed through listed jurisdictions will be subject to additional reporting requirements by EU tax authorities, and (iii) member states have committed to including other specific sanctions, such as increased monitoring and audit risks or special withholding rates, although it remains to be seen how many of these will be implemented.

In addition to these, at the time of writing several European countries have also an-

nounced that companies with subsidiaries based in blacklisted countries will not be eligible for government aid being provided in response to the ongoing COVID-19 pandemic.

3 Data and empirical approach

The main approach I will be using is a regression-discontinuity framework. In this section I will discuss how that framework is specified, what running variables I will be using for the estimation, and the tax governance outcomes I will be considering.

3.1 RD framework

The main problem faced in estimating the impact of the review and blacklisting process is non-random selection into both. We know that the EU chose its three criteria for selection based on the assumption that they were positive correlated with a jurisdiction's likelihood of facilitating tax avoidance that would affect EU member states. We also know that the final choice of the grey and black lists was determined endogenously by jurisdictions responding to the EU's pressure to reform. So a simple comparison of selected countries versus those that were not selected, or listed versus unlisted countries, is likely to lead to biased estimates of the impact of the EU selection process.

However, I can take advantage of the fact that the EU's selection process incorporated arbitrary cutoffs to determine eligibility, leading jurisdictions with similar scores to face very different outcomes solely because they fell on opposite sides of the eligibility threshold. In a regression discontinuity framework, the premise is that, absent any impact of the EU selection process, the relationship between a jurisdiction's score on the criteria and its likelihood of adopting new tax transparency standards would be continuous as it crosses that threshold.

Consider the following empirical specification. Let Y_i be the tax governance outcome of interest for jurisdiction i. We are interested in the impact that selection into the EU review process, S_i has on subsequent outcomes Y_i. Consider the following reduced form equation, where:

$$Y_i = \alpha_1[D_i > 0] + \alpha_2 f(D_i) + \alpha_3 f(D_i) \times [D_i > 0] + \mathbf{X}_i\beta + \epsilon_i \tag{1}$$

Where D_i indicates the jurisdiction's distance to the cutoff used by the EU to determine selection into the review process. $f(D_i)$ is a function of that distance, allowed to vary in slope on either side of the cutoff. In the next subsection I will discuss how that distance measure is constructed. $\mathbf{X}_i$ is a vector of jurisdiction characteristics included as controls. In this specification, α_1 estimates the effect of crossing the EU selection threshold has on the tax governance outcome of interest.

However, not every jurisdiction that passed the threshold was eventually selected for review. So in addition to the reduced form specification above, we can use a 'fuzzy'

regression discontinuity approach, where first we estimate the impact that crossing the threshold has on selection S_i:

$$S_i = \alpha_1[D_i > 0] + \alpha_2 f(D_i) + \alpha_3 f(D_i) \times [D_i > 0] + \mathbf{X}_i\beta + \epsilon_i \tag{2}$$

and then use the selection outcome from (2) as an instrument for selection in the below equation:

$$Y_i = \gamma_1 S_i + \gamma_2 f(D_i) + \gamma_3 f(D_i) \times S_i + \mathbf{X}_i\beta + \epsilon_i \tag{3}$$

For estimation of equations (1) and (3), I will proceed as follows: I estimate treatment effects using local linear estimation, using bandwidth selection and bias-correction methods outlined in Calonico, Cattaneo, and Titiunik (2014), Calonico, Cattaneo, and Farrell (2018) and Calonico, Cattaneo, Farrell, and Titiunik (2019). I do this separately for the reduced form impact of crossing the selection threshold and in the fuzzy RD framework, where the selection indicator in equation (2) is used as an instrument for S_i in equation (3).

I also, for completeness, calculate results using global quadratic and cubic functions, [7] as well as a simple OLS regression where different orders of each EU selection indicator are into the equation separately (rather than aggregated as a single running variable). These results are presented in Table A6 in the Online Appendix.

Next, I'll discuss the EU scoreboard data in detail as well as how I will construct the running variable D_i, given the multidimensional nature of the data.

3.2 The EU scoreboard data

As discussed above, the EU ranked jurisdictions according to three criteria: their strength of each jurisdiction's economic ties with the EU, their level of financial activity, and the degree to which each is stable enough to be an attractive destination for funds. Each indicator was constructed using the following data:

1. **Strength of ties**: constructed using measures of the jurisdictions total trade with the EU, trade in services, both inward and outward FDI flows and the presence of foreign affiliates of EU-based companies

2. **Financial activity**: inward and outward dividends, interest payments, royalties, and FDI stocks

3. **Stability factors**: control of corruption and regulatory quality, as measured by the World Bank's Worldwide Governance Indicators

[7] As noted in Gelman and Imbens (2019), higher order polynomials, particularly when the polynomial is global (defined over the entire sample, as described in the equation above) can lead to noisy estimates and bias.

For each indicator, jurisdictions were given a rank which represented their highest rank across all measures used.[8] Then within each indicator, these ranks were transformed into percentage scores, so that a jurisdiction that is - for example - ranked 8 out of 130 is assigned the percentage of score $\frac{8}{130} \times 100 = 6.15$.

The Commission then set cutoffs (60,40,70) for each indicator which reflected the priority it placed on each dimension. Jurisdictions with a percentage score *lower* than the cutoff in *all* three indicators were selected for further investigation.[9]

There were several exceptions to the EU selection process. Jurisdictions designated as Least Developed Countries (LDCs) by the United Nations were excluded on the grounds that they faced constraints in improving their tax governance, although they were still ranked. Several jurisdictions which already had a transparency agreement with the EU in place were also excluded.[10] Finally, and somewhat contentiously, the European Union excluded its own member states from the scoring and listing process.

3.3 Running variable(s)

To construct a running variable, I take two main approaches. The first is to construct a multidimensional running variable out of three percentage scores the EU used. The second is to use a percentage score that is the most binding for countries. I explain each of these in turn below:

(i) Multidimensional (MD) running variable

Normally, a regression discontinuity framework relies on a single running variable to determine assignment to treatment. In the case of the EU review process, I am faced with three, all of which need to exceed a specific threshold. To simplify the analysis, I collapse the three indicators into a single running variable, D, where D indicates the distance in percentile points the jurisdiction is from being eligible for review.

Consider Figure 2, which graphs each jurisdiction by its three percentage scores in three dimensional space. The purple cuboid represents the "selection space," within which a jurisdiction is eligible for review by the European Union. For example, a jurisdiction with a percentage score of (59,39,69) is just inside this space where a jurisdiction with a percentage score of (61,41,71) is just outside.

To construct a univariate running variable, I calculate the distance from each jurisdiction to the boundaries of this selection space. There are two ways to do this. The traditional way is to calculate the minimum Euclidean distance to the selection space, so that for a jurisdiction with non-missing values of each indicator:

[8] The entire methodology is described here: https://ec.europa.eu/taxation_customs/sites/taxation/files/2016-09-15_scoreboard-methodology_en.pdf

[9] If data on only one or two indicators were available, jurisdictions were selected if they passed the cutoff for just those indicators.

[10] Switzerland, Liechtenstein, Andorra, Monaco and San Marino.

$$D = -\sqrt{(X-60)^2 + (Y-40)^2 + (Z-70)^2}$$

When the jurisdiction is above all three thresholds ($X < 60, Y < 40, Z < 70$). If it is below one or two thresholds, the distance is calculated on any remaining unmet thresholds. If a jurisdiction has passed below all three thresholds, the relevant distance is the closest threshold (since a percentage score above a single threshold makes a jurisdiction ineligible).

$$D = -min[X-60, Y-40, Z-70]$$

Note I have defined D so it takes on positive values when a jurisdiction is below all three thresholds (and thus eligible for selection) and negative values when it is above at least one threshold.

In practice, the Euclidean distance may not be the best measure of changes in the three dimensions. Consider Bhutan, which has scores of approximately (91,69,85). Its Euclidean distance to the boundary is 45 in percentage score units. However, practically, to qualify for selection into the EU review process, Bhutan would have to improve on all three of its scores until all three fell within their respective cutoffs: (91-60,69-40,85-70) = (31,31,5), the sum of which is 67 percentage points. So the actual change in the underlying factors is greater than what is suggested by the Euclidean distance.

So rather than use the Euclidean distance, I construct a multidimensional running variable which captures the minimum distance across all dimensions a country must travel in order to cross the selection boundary, so that when a jurisdiction is outside the selection boundary:

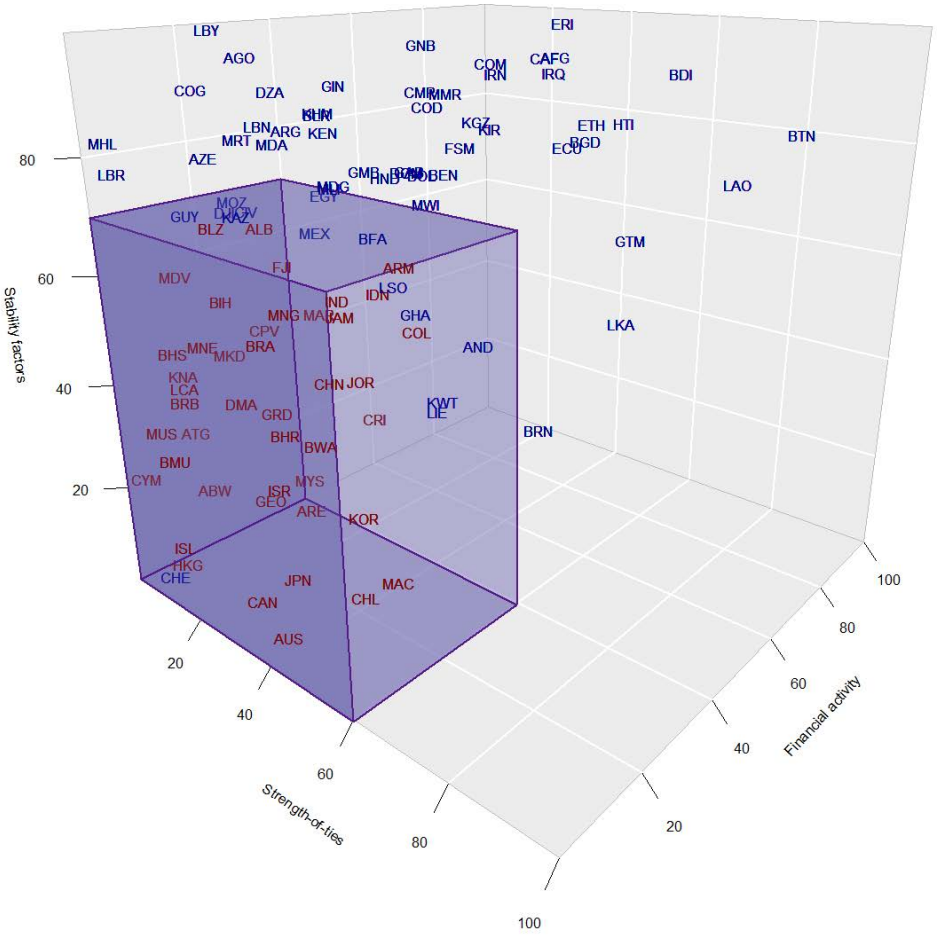
$$D = -1[(X-60)1\{X > 60\} + (Y-40)1\{Y > 40\} + (Z-70)1\{Z > 70\}]$$

Where $1\{X > 60\}$ is an indicator = 1 if X is above 60, and so on. The distance for jurisdictions below the selection boundary remains the same. As another example: a country with percentiles scores of (50,50,80) must move by (0,-10,-10) to reach the boundary, so faces a distance of -20 (rather than -14.4, the Euclidean distance). By contrast, a country with percentile scores of (20,20,20) must only move by (-20,0,0) to reach the nearest boundary, which is the same as the Euclidean distance. In the Online Appendix I also present results using the Euclidean distance, and find that that it makes no qualitative difference to the headline results.[11]

Centering the running variable around a three-dimensional cutoff an equivalent procedure to what Wong, Steiner, and Cook (2013) describe as the 'centering' procedure for collapsing a multidimensional RD into a single running variable RD. The main limitation to this approach is that it estimates a frontier average treatment effect (FATE) which is

[11] Table A6

Figure 2: 3D scatterplot of each jurisdiction's score on the three EU indicators, relative to the set of scores necessary to qualify for selection into the review process



Note: Jurisdictions are mapped in 3D space according to the percentage score assigned by European Union. The purple cuboid indicates the point at which the jurisdiction passes each of the three thresholds for selection into the EU review process (the selection space), which is 60 for the strength of ties measure, 40 for financial activity and 70 for stability factors. Jurisdictions highlighted in red were selected. The multidimensional running variable is the minimum distance in percentage score values required to travel to the nearest side of the selection space, moving one dimension at a time.

the weighted average of the univariate treatment effects defined over each indicator's frontier (e.g. the treatment effect around crossing each threshold separately). The weights of the FATE are not scale invariant: for instance, re-scaling X by a positive number will decrease the weight placed on the univariate treatment effect for X. This makes the choice of scale for each indicator important, as it determines each indicator's relative contribution to the estimated treatment effect. For the analysis here, I take the EU's construction of its indicators and its assignment process as given, keeping each indicator defined in percentiles, and assuming the indicators are comparable in percentile space.

This is a strong assumption, as it assumes that moving up one percentage score in, for example, stability factors is equivalent to moving up one percentage score in financial activity.

(ii) Stability factors (SF) running variable

As both a robustness check, and to investigate possible heterogeneity in impact of the EU's review process, I also estimate treatment effects using a univariate running variable defined solely over the 'stability factors' indicator. As shown in Table A1 in the Online Appendix, out of the three indicators, this one has the greatest predictive power in a RD setting, due to the fact that most jurisdictions around the stability factors threshold have already exceeded the other two thresholds. It is also the running variable for which jurisdictions appear the most balanced on pre-treatment observable characteristics, giving it one advantage over the multidimensional running variable.

3.4 Tax governance outcomes

In choosing tax governance outcomes to consider in the analysis, I rely in part on those set out by the EU Council as criteria on which listed jurisdictions would be assessed.[12] These are listed in detail in Table A5 in the Online Appendix, but can be broadly grouped into three categories: (1) tax transparency, (2) fair taxation and (3) anti-BEPS measures.

For each of these categories, I have picked the most proximate, measurable outcomes relevant to the EU. One challenge is that not all goals are perfectly measured. For example, under its "fair taxation" criteria, the EU requires that a jurisdiction has no harmful tax regimes in place. Both the EU's COCG and the OECD's Forum on Harmful Tax Practices (FHTP) conduct reviews of preferential regimes across many jurisdictions. Harmful regimes are detected through these reviews and jurisdictions typically (but not always, hence the blacklist) revise or abolish them so they are no longer considered harmful. However, we only observe harmful regimes in jurisdictions that the COCG or the FHTP choose to review. The former is driven primarily by which jurisdictions were selected for review by the COCG, while the latter is mainly driven by jurisdictions that have signed up to the Inclusive Framework. This means that harmful regimes may still exist in jurisdictions that have not received attention from either body. Without an objective measure

[12] https://data.consilium.europa.eu/doc/document/ST-14166-2016-INIT/en/pdf

for every jurisdiction, it is impossible to know the true effect of the EU on harmful tax regimes.

In lieu of this, I have created an outcome which is in the spirit of the EU objective: a jurisdiction is considered 'not harmful' if it has been reviewed by either the COCG or the FHTP *and*, as of the latest COCG and FHTP reports, it has no active harmful regimes or has set a date for an upcoming rollback.[13] Thus, if a jurisdiction has not been reviewed, or it has been reviewed, found to have harmful regimes and has not committed to abolishing them or rendering them benign, it will not be counted as a success in this outcome measure. In One of the successes that the EU takes credit for is nudging jurisdictions to eliminate harmful tax systems (European Commission 2020). In Section 5.1 I investigate these impacts further, although I am not able to put precise estimates on the number of harmful tax regimes eliminated as a result of the process.

Table 1 displays the full list of observable outcomes that I will use which either directly measure the EU's criteria or reflect a reform process that a jurisdiction must follow in order to eventually comply with the EU's criteria. Data on each of these outcomes was obtained directly from OECD online sources as of April, 2020. One difficulty with OECD reporting on tax governance reforms is a lack of panel data: in many situations it is only possible to observe the current state of affairs rather than precisely when a jurisdiction enacted a certain reform. For my analysis of how the effects of the EU listing process have changed over time, when possible I have used the Internet Archive's *Wayback Machine*[14] to retrieve earlier instances of public data.

While I will report results for each of these outcome groups separately, to reduce concerns over multiple hypothesis testing, I construct indices for each outcome group. With the sole exception of the proportion of EU member states covered by an automatic exchange of information agreement (A.2), each of these outcomes is binary, so I construct the index as a simple mean of each outcome measure across the group. So, for example, if a jurisdiction has signed up to country-by-country reporting (C.1) but not yet adopted the MLI position (C.2) or published a MAP profile (C.3), its Anti-BEPS mean outcome will take a value of $\frac{1}{3}$.

One challenge in using a regression discontinuity framework in a cross-country setting is a general lack of power. As will be seen in the next section, the average effective number of observations being used varies between 40-80 countries. One concern is that low levels of power make it too difficult to reject the null hypothesis of no effect, meaning that modest impacts of the EU review and listing process will go undetected.

I can allay these concerns somewhat by constructing additional outcomes where, if the EU's involvement is having a sizable impact on international tax governance, we'd expect large enough effect sizes that the minimum detectable effect (MDE) hurdle is likely to be cleared. For this, I construct one additional outcome measures: a variable equal to the number of proxies for the four minimum standards a jurisdiction has implemented to

[13] This includes both preferential tax measures and offshore structures lacking substance requirements.
[14] http://web.archive.org/

Table 1: EU-targeted tax governance outcomes and measures used in paper

Outcome group	Outcome measure	Data sources
A. Tax transparency	A.1 Public commitment to exchange information under the Common Reporting Standard (CRS) for AEOI by 2020[a]	OECD AEOI Portal,[a] OECD Convention website, [b], OECD EOIR portal[c]
	A.2 Percentage of EU member states jurisdiction has a AEOI relationship with	
	A.3 Commitment to (or signatory of) Multilateral Convention on Mutual Administrative Assistance (MAA)	
	A.4 "Largely compliant" or better rating by Global Forum on EOIR	
B. Fair taxation	B.1 Jurisdiction reviewed at least once by either the EU Code of Conduct Group (COCG) or *(BEPS Action 5)* the OECD Forum on Harmful Tax Practices (FHTP) and, as of July-Dec, 2019, no harmful regimes are present.	EU COCG data on all regimes reviwed since 1998[i]
C. Anti-BEPS	C.1 *(BEPS Action 13)* Becoming a signatory of the CbC MCAA	OECD CBCR and MLI sites,[e] [f] OECD Map Profile list[g]
	C.2 *(BEPS Action 6)* Becoming a signatory of the Multilateral Convention to Implement Tax Treaty Related Measures to Prevent BEPS (MLI Position)	
	C.3 *(BEPS Action 14)* Publication of Mutual Agreement Procedure (MAP) profiles	
Intermediate outcomes	I.1 Membership in the Inclusive Framework on BEPS	OECD IF membership list [d], EU Code of Conduct Group Reports [h], OECD Harmful Tax Practices Peer Review Report[j]
	I.2 Membership in the Global Forum on Transparency and Exchange of Information for Tax Purposes	
	I.3 Jurisdiction is greylisted by the EU in December 2017	
	I.4 Jurisdiction is blacklisted by the EU in December 2017	
	I.5 Jurisdiction is *either* grey or blacklisted by the EU in December 2017	

[a] https://www.oecd.org/tax/automatic-exchange/crs-implementation-and-assistance/crs-by-jurisdiction/
[b] https://www.oecd.org/tax/exchange-of-tax-information/Status_of_convention.pdf
[c] https://www.oecd.org/tax/transparency/exchange-of-information-on-request/ratings/
[d] https://www.oecd.org/tax/beps/inclusive-framework-on-beps-composition.pdf
[e] https://www.oecd.org/tax/automatic-exchange/about-automatic-exchange/CbC-MCAA-Signatories.pdf
[f] http://www.oecd.org/tax/treaties/beps-mli-signatories-and-parties.pdf
[g] https://www.oecd.org/tax/dispute/country-map-profiles.htm
[h] https://www.consilium.europa.eu/en/policies/eu-list-of-non-cooperative-jurisdictions/timeline-eu-list-of-non-cooperative-jurisdictions
[i] https://data.consilium.europa.eu/doc/document/ST-9639-2018-REV-4/en/pdf
[j] https://www.oecd.org/tax/beps/harmful-tax-practices-peer-review-results-on-preferential-regimes.pdf

date: (B.1) being cleared of harmful tax regimes, (C.1) CbCr commitment, (C.2) signing up to the MLI and (C.3.) publishing a MAP profile. This "minimum effort' outcome is intended to pick up even the slightest effort at meeting these basic tax governance outcomes. Given that the median number of these outcomes that have been reached is 3 for non-LDC jurisdictions selected into review by the EU and 0 for those that are not, an impact of 2 seems like a reasonable expectation, one that is also in line for the MDE for this outcome in the main reduced-form specification.

3.5 Validity of RD

3.5.1 Density tests

Density tests of the two main running variables are presented in Figure A1 in the Online Appendix. A standard test for manipulation of the running variable fails to reject the null of no manipulation in each case. It would be unusual for there to be signs of manipulation in this context, as the EU's construction of its percentage scores mechanically smooths the distribution, making any bunching near a particular cutoff unlikely.

3.5.2 Balance

One way we can be more assured that the regression discontinuity approach is valid is to check for balance in our outcomes of interest and for a variety of economic indicators prior to the EU selection process. Tables A2 and A3 in the Online Appendix check balance for pre-treatment outcomes of interest. This includes all the measures used by the EU to construct its three selection indicators,[15] the selection indicators themselves, as well as Log(GDP per capita) from 2015 and, when available, the jurisdiction's score from the 2015 edition of the Tax Justice Network's Financial Secrecy Index (FSI). While there is good balance across most indicators for the stability factors cutoff, the multidimensional cutoff has a small imbalance in Log(GDP per capita), so I will be including it as a control in my main specification.

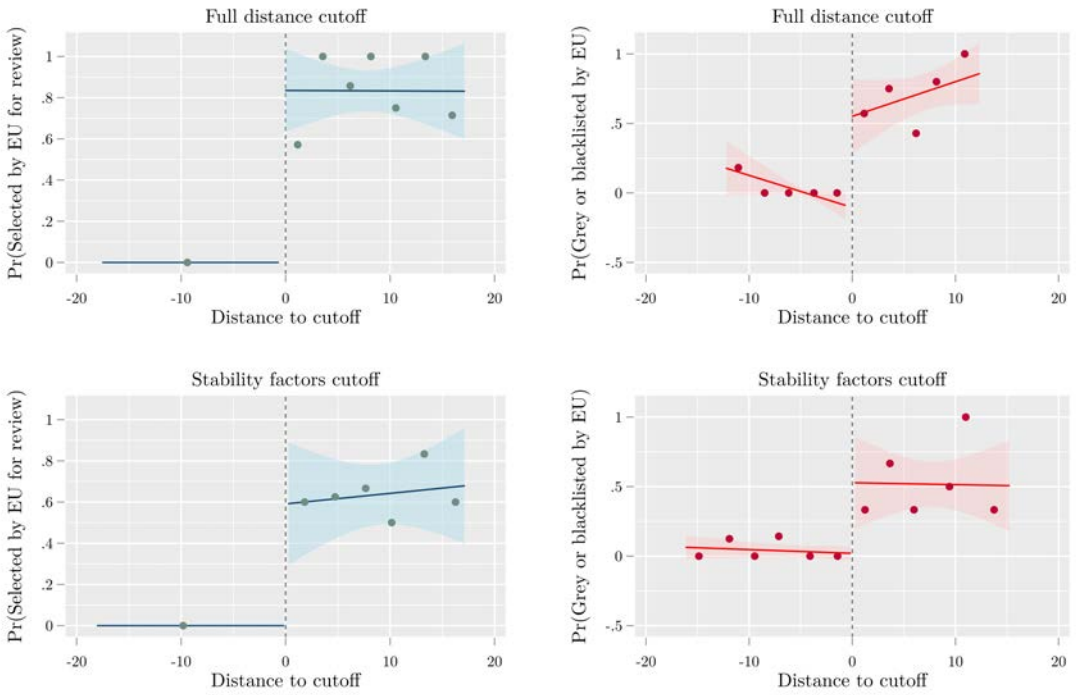
3.6 Pseudo-cutoffs

I also test for effects using alternate, pseudo cutoffs for two of the main robust outcomes of interest (grey/blacklisting and IF membership) and find no consistent evidence that effects are present when I am using an alternate cutoff. These are presented in Figure A2 in the Online Appendix.

[15] These are indicators sourced from Eurostat, the IMF, and UNCTAD, and are averaged over the five year period preceding the EU selection (2011-2016)

Figure 3: Crossing the selection threshold increases the probability of selection and of subsequent black/greylisting

(a) Outcome = selected for review **(b) Outcome = black or greylisted**



Notes: Each figure shows the results of a local linear regression-discontinuity estimate, without controls, of the (reduced form) effect of crossing the EU selection threshold on (a) selection into the review process and (b) being grey and blacklisted December, 2017. Actual values are shown in Columns (1) and (5) of Table 2). Running variables are the multidimensional and stability factors cutoffs described above. 90% confidence intervals shown. Bins chosen using mimicking variance evenly-spaced (ESMV) method (Calonico, Cattaneo, and Titiunik 2015).

4 Results

4.1 First stage results

As discussed above, being selected by the EU implies many possible treatments. Jurisdictions that are selected for review are then assessed for risk factors which determine which to prioritize. Then, through their subsequent interactions with the EU, 'risky' jurisdictions decide whether they are willing to commit to implementing the above reforms. Those that do so are added to the EU's greylist until the reforms or complete (or they are upgraded) and those that do not are blacklisted. Because the selection between the two lists is endogenous, the treatment effect implied by crossing the threshold captures the entire impact of the EU review and listing process.

Figure 3 displays the results of the local linear RD specification estimating the reduced form effect of crossing the two thresholds (MD and SF) on the probability of being selected for review and on subsequent grey or blacklisting. Note that the probability of selection is

Figure 4: Main RD results
Multidimensional cutoff

Notes: Each figure shows the results of a local linear regression-discontinuity estimate, without controls, of the (reduced form) effect of crossing the EU selection threshold on each of the three main tax governance outcomes (Column (1) of Table 2). Running variable is the multidimensional (MD) cutoff described above. 90% confidence intervals shown. Bins chosen using mimicking variance evenly-spaced (ESMV) method (Calonico, Cattaneo, and Titiunik 2015).

only lower than one in the multidimensional specification due to the inclusion of LDCs in the sample. The bottom of Table 2 displays the point estimates for grey and blacklisting: jurisdictions that cross the MD threshold are 60-75 percentage points more likely to be subsequently grey or blacklisted. When selection is instrumented for, the point coefficients indicate that grey or blacklisting is all but determined by selection. The SF specification also shows strong and significant results, albeit slightly smaller than the multidimensional specification.

Now that we have established that these thresholds are binding - that crossing them drastically increases the chance of being reviewed and subsequently listed by the European Union - I will turn to the actual impacts on tax governance outcomes.

4.2 Impact on tax governance outcomes

Figure 4, which displays plots of the RD specification for each of the three main tax-governance outcomes, shows the headline results: while there is weak evidence of small effects on Tax Transparency and Anti-BEPs outcomes, they are not statistically significant. However we see large effects on the Fair Taxation outcome, which is wholly defined by being reviewed by either the EU or OECD for harmful tax practices and, at present, having no harmful regimes in operation.

Table 2 shows both the reduced form and fuzzy RD results for both cutoffs with and without controls. For Tax Transparency, selection by the EU into the review process changes the average result by between 0.2 and 0.48, depending on the specification, none of which are significant. It is worth noting that in the MD specification, selection into the EU review process has a large, statistically significant impact on being compliant with EOIR standards, of up to 90 percentage points. The estimated effects are much smaller and insignificant for the SF specification, which may reflect heterogeneity in the treatment effect.

For Fair Taxation, selection increases the chance of having at least one regime reviewed no longer having harmful regimes present by 68-100 percentage points[16] For Anti-BEPS outcomes, selection increases the mean outcome by 14-36 percentage points, on average, but this is not statistically significant.

Selection into the EU review process has enormous implications for IF membership, increasing the probability of joining by between 70-100 percentage points, depending on the specification. By contrast, there is also no robust evidence that selection increases the probability of signing up to the Global Forum, an alternative outcome I consider.

Some of these outcomes, while statistically significant, are still sizable effects. In many circumstances (although not in the case of Fair Taxation) these results are slightly underpowered, with minimum detectable effects (MDEs) of around 0.5-0.65 for the mean outcomes at 80% power and 90% confidence.[17] However, it is worth pointing out that only the Fair Taxation result shows such a high degree of stability across these specifications (as well as alternate specifications in the Online Appendix).

Still, it is possible that choosing mean outcomes sets the bar too high relative to the desired outcomes of the EU process. Recall that the EU review process was designed to uncover deficits in standards. For example, some jurisdictions may have had not signed up to country-by-country reporting, where others may not have implemented AEOI. Focusing on average improvements across all indicators may be ignoring these improvements on the margin.

To set a lower bar, as described above, I also included an indicator of how many proxies

[16] Many of these results predict increases of more than 100 percentage points, an artifact of the linear probability model.

[17] A competing concern is that the small number of effective observations in many of these regressions may lead to artificially-small standard errors. In Table A4 in the Online Appendix I show that the results are robust to the use of the wild bootstrap procedure from Cameron, Gelbach, and Miller (2008) implemented using the Stata module `boottest| (Roodman, Nielsen, MacKinnon, and Webb 2019)`.

Table 2: Impact of EU review process on targeted outcomes

	Multidimensional cutoff (MD)				Stability factors cutoff (SF)			
	Reduced form		*Fuzzy RD*		*Reduced form*		*Fuzzy RD*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(A) Tax transparency:								
Mean outcome	0.34	0.17	0.48	0.27	0.22	0.16	0.31	0.20
	(0.27)	(0.22)	(0.37)	(0.34)	(0.27)	(0.30)	(0.41)	(0.43)
(i) CRS committment by 2023	0.19	-0.14	0.26	-0.23	0.37	0.25	0.51	0.32
	(0.32)	(0.25)	(0.42)	(0.40)	(0.29)	(0.31)	(0.47)	(0.44)
(ii) % of EU countries covered by AEOI	0.19	0.0071	0.26	0.011	0.26	0.21	0.39	0.35
	(0.28)	(0.22)	(0.37)	(0.33)	(0.21)	(0.22)	(0.33)	(0.37)
(iv) Largely compliant on EOIR	0.60**	0.56**	0.84**	0.91**	0.23	0.14	0.31	0.17
	(0.26)	(0.23)	(0.37)	(0.37)	(0.33)	(0.35)	(0.50)	(0.51)
(iii) Signed up to MAA	0.36	0.25	0.50	0.40	0.082	0.028	0.11	0.039
	(0.32)	(0.28)	(0.44)	(0.43)	(0.39)	(0.41)	(0.57)	(0.57)
(B) Fair taxation:								
Mean outcome	0.53***	0.57***	0.68***	0.90***	0.76	0.87***	1.21***	1.23***
	(0.19)	(0.18)	(0.20)	(0.24)	(0.49)	(0.31)	(0.36)	(0.34)
(i) Reviewed w/ no harmful regimes	0.53***	0.57***	0.68***	0.90***	0.76	0.87***	1.21***	1.23***
	(0.19)	(0.18)	(0.20)	(0.24)	(0.49)	(0.31)	(0.36)	(0.34)
(C) Anti-BEPS:								
Mean outcome	0.15	0.089	0.21	0.14	0.20	0.28	0.30	0.36
	(0.25)	(0.22)	(0.33)	(0.34)	(0.30)	(0.29)	(0.40)	(0.40)
(i) Signed up to Cbcr	0.20	0.11	0.28	0.18	0.23	0.21	0.34	0.27
	(0.24)	(0.24)	(0.31)	(0.37)	(0.37)	(0.38)	(0.59)	(0.51)
(ii) Signed up to MLI	-0.030	-0.056	-0.039	-0.089	-0.14	-0.13	-0.20	-0.16
	(0.34)	(0.31)	(0.46)	(0.49)	(0.41)	(0.45)	(0.61)	(0.62)
(iii) Published MAP profile	0.25	0.13	0.32	0.20	0.60	0.75**	0.92	0.98**
	(0.27)	(0.26)	(0.34)	(0.39)	(0.56)	(0.34)	(0.59)	(0.50)
Intermediate outcomes:								
Participation in IF	0.54**	0.70***	0.69**	1.13**	1.15***	1.18***	1.90	1.59*
	(0.23)	(0.25)	(0.32)	(0.53)	(0.34)	(0.35)	(1.26)	(0.81)
Signed up to Global Forum	-0.093	-0.095	-0.13	-0.15	0.13	0.12	0.19	0.15
	(0.31)	(0.27)	(0.41)	(0.42)	(0.59)	(0.68)	(0.90)	(0.90)
Greylisted in 2017	0.51**	0.55***	0.71***	0.89***	0.52	0.54*	0.74***	0.76***
	(0.22)	(0.21)	(0.25)	(0.29)	(0.33)	(0.28)	(0.23)	(0.25)
Blacklisted in 2017	0.22	0.10	0.30	0.16	0.014	-0.050	0.015	-0.071
	(0.16)	(0.14)	(0.21)	(0.22)	(0.12)	(0.13)	(0.19)	(0.20)
Either grey or blacklisted	0.75***	0.60***	1.04***	0.98***	0.53**	0.47*	0.84***	0.74***
	(0.17)	(0.16)	(0.085)	(0.12)	(0.25)	(0.25)	(0.21)	(0.24)
Other outcomes:								
Number of minimum standards	1.07	0.67	1.46	1.05	1.59	1.88**	2.38*	2.42*
	(0.82)	(0.65)	(1.07)	(0.97)	(1.15)	(0.94)	(1.28)	(1.34)
Controls		X		X		X		X
Observations	194	194	194	194	177	177	177	177
Avg Effective # Obs	79	68	79	68	45	42	45	42
Avg Bandwidth	16	14.5	16	14.5	9.98	9.37	9.98	9.37

Notes: Each cell shows the estimated impact of selection into the EU review process on a different outcome, using bandwidth-selection, bias-corrected, robust methods outlined in Calonico, Cattaneo, and Titiunik (2014), Calonico, Cattaneo, and Farrell (2018) and Calonico, Cattaneo, Farrell, and Titiunik (2019). Each column indicates a different specification, and each column pair indicates a different running variable (e.g. stability factors, multidimensional). *Mean outcome* indicates the average of all sub-outcomes listed under a category. $^{*}p < 0.10$,$^{**}p < 0.05$,$^{***}p < 0.01$

for the four minimum standards a jurisdiction has implemented: review and non-existence of harmful tax practices, CbCr, the MLI position, or published a MAP profile. While this does not, in itself, improve power, we might expect the impact of the EU review to have a much larger impact on this outcome. The results using the MD specification suggest this is not the case: it finds that selection increases the number of minimum standard met by 1-1.46 percentage points, a result that is not significant.

However, the SF specification indicates that selection may have had an impact of roughly 2.4 minimum standards. Examining the results from each individual outcome suggest this is primarily being driven by the harmful regime outcome (B.1) and the publication of MAP profiles (C.3).

Why are these results different for the stability factors cutoff? Recall that, while the MD specification estimates a frontier average treatment effect (FATE), a weighted average of each of the three selection indicators, the SF specification only estimates a local average treatment effect (LATE) for jurisdictions on either side of that particular cutoff. This suggests there is some heterogeneity in the effect of the EU selection over different jurisdictions. One possibility is that jurisdictions close to the stability factors cutoff were initially more responsive to EU attention: the estimated impact of EU selection on grey/blacklisting in the SF specification is lower, suggesting that jurisdictions around this cutoff may have done more to improve their tax governance outcomes to avoid being listed.

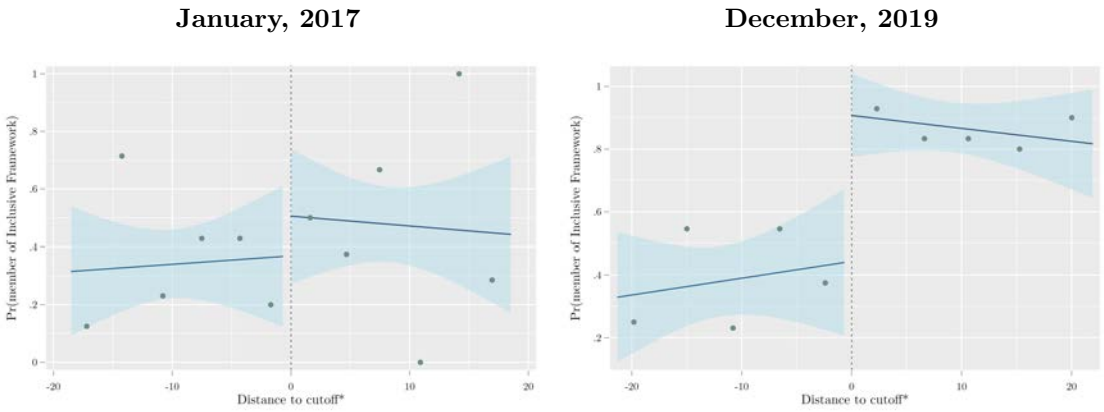
Table A6 in the Online Appendix shows the same results using a global RD specification with varying polynomial functions, as well as a flexible specification where each EU criteria is entered in as a separate function (a la Dell (2010)). In these results, the impact of selection in the EU review process on Fair Taxation is significant and robust across nearly every specification, a result driven entirely by the impact of the EU process on participation in the Inclusive Framework. There is modest evidence of an impact on the Anti-BEPs mean outcome, but this is primarily driven by IF participation.

4.3 Effects over time

Given that selection into the EU review process implied several different treatments occurring at different stages, it is worth exploring the dynamics of these effects. For example, Figure 5 displays the basic local linear RD result of the impact of crossing the MD threshold on Inclusive Framework membership in January, 2017, as the EU review process kicked off, versus the end of 2019. From this graph, it is clear that there has been a substantial increase in IF membership for jurisdictions just to the right of the cutoff, but little change on the left.

To dig into this further, in this section, I look at three outcomes that I have panel data for which are either a component of the treatment (whether a jurisdiction is black or greylisted) or an outcome we know from the previous section to be affected by selection (membership in the Inclusive Framework) or one we failed to find an effect for

Figure 5: Inclusive Framework Membership at the start of the EU screening process versus today



Notes: Each figure shows the results of a local linear regression-discontinuity estimate, without controls, of the (reduced form) effect of crossing the EU selection threshold on each of the three main tax governance outcomes (Column (1) of Table 2). Running variable is the multidimensional cutoff described above. 90% confidence intervals shown. Bins chosen using mimicking variance evenly-spaced (ESMV) method (Calonico, Cattaneo, and Titiunik 2015).

(signing up for country-by-country reporting, CbCr). For the former, I digitized every EU grey/blacklist released between December 2017 and February 2020. For the IF membership, I constructed a panel of IF membership using information from OECD-published membership lists, OECD announcements of specific join dates, and and reports from several of the "Big Four" consultancy firms. CbCr commitment dates are obtained directly form the OECD website.

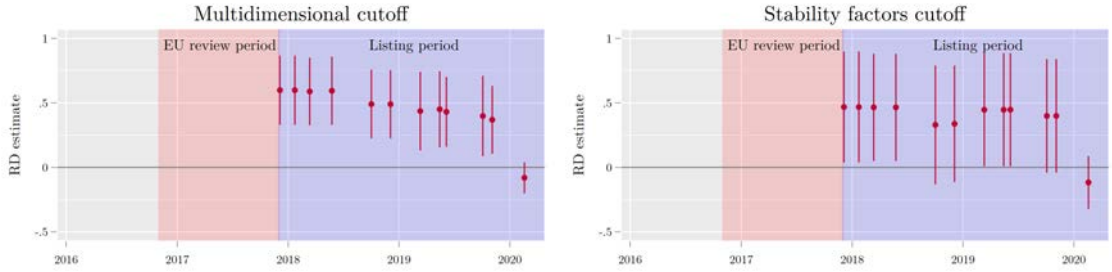
Figure 6 displays the results from this exercise for each of the three outcomes, using both the MD and SF specifications. The period of the EU review process is highlighted in red, after which the EU began publishing its grey and blacklists. The impact of crossing the RD threshold on the probability of ending up on the EU's list is approximately 50 percentage points at the time the first list is published. This effect fluctuates slightly over the course of the next two years, but becomes both statistically and economically indistinguishable from zero by the time the last list was published in February 2020. This is driven by the removal of a large number of jurisdictions from the greylist at the end of 2019 after meeting their policy targets.

The impact of crossing the threshold on IF membership is statistically indistinguishable from zero prior to the selection process.[18] However, during the review process the effect begins to increase and is large and significantly positive during the summer of 2017, several months prior to the publication of an EU list. This was the period during which the EU was intensely reviewing jurisdictions to determine if they would be eligible for listing, suggesting that it was the EU review process itself, as well as the upcoming threat of the grey and blacklist publication, that induced jurisdictions to join the Inclusive Framework.

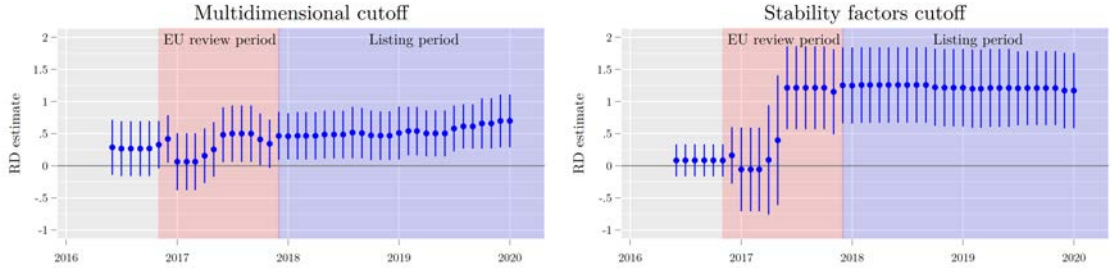
[18]There are some signs of imbalance in the MD specification prior to the review process, but these recenter around zero as of January, 2017, which is when the review process formally began.

Figure 6: Reduced form RD estimates across time

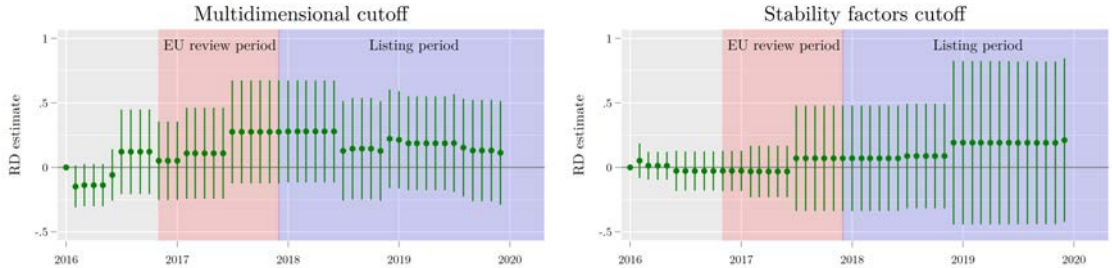
(a) Outcome = greylisted or blacklisted



(b) Outcome = member of the Inclusive Framework



(c) Outcome = signed up for CbCr



Notes: Figure shows the robust, bias-corrected estimate of the effect of crossing the RD threshold on (a) the probability of currently being on either the EU greylist or its blacklist, (b) the probability of being a member of the Inclusive Framework or (c) the probability of having signed up for Country-by-Country Reporting. Each estimate is measured at a different point in time. Red shaded area indicates the period during which the EU reviewed selected jurisdictions and issued communications to invite jurisdictions to adopt better tax governance standards. Blue shaded area indicates the beginning of the grey and blacklisting period. Left column displays estimates using multidimensional cutoff and right column displays estimates using the stability-factors cutoff. 90% confidence intervals.

Finally, the rate at which jurisdictions sign up for CbCr is never significantly affected by the EU review process. However, the point estimate does increase slightly during the review process - suggesting it may have had a marginal effect on CbCr adoption.

4.4 Difference-in-difference estimates

Given that a a handful of these tax governance outcomes are observable over time,[19] using a method which exploits this dimension, such as differences-in-differences (DiD), would initially seem to be an attractive way of estimating the effects of the EU review and screening process.

Let's focus first on the review process itself, the treatment I considered in the RD framework above.

Consider a standard event-study design framework:

$$Y_{it} = \alpha_i + \alpha_t + \sum_{j=-K}^{-2} \beta_j 1\{t - t*_{selected} = j\} + \sum_{j=0}^{L} \beta_j 1\{t - t*_{selected} = j\} + \epsilon_{it} \quad (4)$$

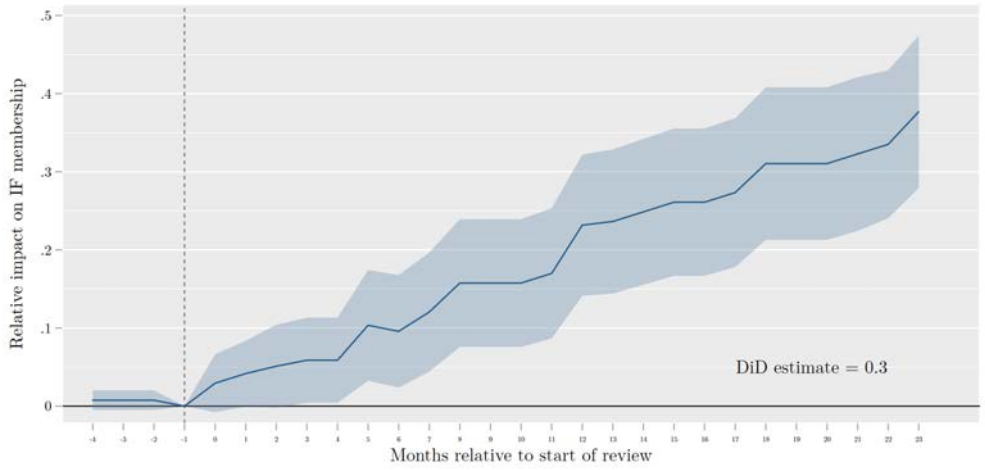
Where Y_{it} is the outcome of interest for jurisdiction j at time t and α_i and α_t are jurisdiction and period fixed effects, respectively. $\{t - t*_{selected} = j\}$ are event study dummies equal to one when an observation is j periods prior to its treatment, and zero if not or if the jurisdiction was never treated. For the treatment of interest (being selected into the EU review process), treatment happens concurrently for all treated units, so all the identifying variation comes from comparisons between selected jurisdictions and non-selected jurisdictions. Thus, the identifying assumption is that there are parallel trends between these two units.

This framework presents several challenges: many of the tax governance outcomes of interest became actionable only shortly before or even during the EU review process. For example, while some jurisdictions privately committed to joining a few months prior, the first official meeting and public list of Inclusive Framework Members occurred at the end of June, 2016, just 4-6 months before the screening process began. This limits my ability to establish parallel trends over a long period, as the outcome of interest (IF membership) effectively did not exist before this period. The MLI was only adopted in late 2016, making comparisons of jurisdictions prior to the screening process impossible. Both CbCr and MAA adoption show clear signs of a failure of parallel trends assumption.

With the caveat that the lead time is is short, thus making it difficult to completely pin down parallel trends, Figure 7 presents the results from the impact of the EU review process on Inclusive Framework membership. The few pre-period estimates we can observe suggest little in the way of parallel trends. Following the beginning of the treatment period (November, 2016, when the screening criteria were announced, following by actual screening in January), the Inclusive Framework membership rate of those selected begins to increase, exceeding 30 percentage points by the end of the series (two years later on). Note that the estimated effect is roughly 20 percentage points at 11-12 months following

[19] I have date-specific data for Inclusive Framework membership, CbCr adoption, MLI adoption and MAA membership. While there is public data on dates of automatic exchange of information activation, the actual date the commitment was made is not currently available.

Figure 7: Event-study estimates of the impact of the EU review process on Inclusive Framework membership



Note: Graph shows estimates from event study specification (equation (5)) using monthly data. Standard errors are clustered at the jurisdiction level. 90% confidence intervals shown.

the selection in to the EU review process, which is when the listing began. The fact that an effect opens up even before grey and blacklisting starts is in line with the RD results across time presented in the previous section.

To understand the average impact, I run a standard two-way fixed effects difference-in-difference model of the form:

$$Y_{it} = \alpha_i + \alpha_t + \beta Selected_i + \epsilon_{it} \tag{5}$$

The results from this specification are presented in Table 3. The average different-in-difference effect, presented in column (1) is a 30 percentage point increase in the probability of Inclusive Framework Membership. Columns (2) and (3) show this effect oscillates between 20-35 percentage points if I restrict the sample to the same rough bandwidths used in estimating the RD results above (this essentially compares the evolution of IF membership for jurisdictions just above and below the two RD cutoffs). Given the limitations of DiD in this setting, these results should be taken as indicative but not conclusive evidence of the average treatment effect on the treated (ATT).

Columns (4)-(6) consider the change if we restrict the treatment group to jurisdictions that were selected but not ultimately listed as of December 2017, those that were selected and then greylisted, and those that were selected and then blacklisted. In all cases the control group are those that were not selected. These groups are non-random, so some care must be exercised in interpreting these coefficients: jurisdictions that were selected by the EU for review and would go on to be grey or blacklisted (columns (5)-(6)) saw a faster relative increase in Inclusive Framework membership than those who were selected

Table 3: Difference-in-difference estimates of impact of EU selection/review on Inclusive Framework membership

	(1) Full sample	(2) Multi-dimensional bandwidth <= 16	(3) Stability factors bandwidth <= 10	(4) Treatment = selected but not listed	(5) Treatment = selected and greylisted	(6) Treatment = selected and blacklisted
Selected for review by EU	0.30***	0.20**	0.35***	0.17**	0.34***	0.44***
	(0.045)	(0.076)	(0.12)	(0.065)	(0.062)	(0.092)
R^2	0.828	0.834	0.819	0.908	0.848	0.883
Observations	9,540	3,555	2,025	6,705	7,650	6,570
# jurisdictions	212	79	45	149	170	146

Notes: Table presents different-in-difference estimates of impact of being selected into the EU review process on the probability a jurisdiction joins the inclusive framework. Columns (2) and (3) restrict the sample to the same rough bandwidth used in the regression discontinuity design. Column (4) restricts the treated sample to jurisdictions that are selected but not (initially) subsequently listed in Dec 2017. Column (5) restricts the treated sample to those that are selected and subsequently greylisted in Dec 2017. Column (6) restricts the treated sample to those that are selected and subsequently blacklisted in Dec 2017. Standard errors clustered at the jurisdiction leve. $^{*}p < 0.10$,** $p < 0.05$,*** $p < 0.01$

for review but were not ultimate listed (Column (4)).

It is also possible to use a difference-in-difference framework to examine the impact of the grey and blacklisting process independent of the EU selection process. This is complicated by several factors. First, as I am have shown above, there is evidence that the impact of the EU's listing process began before the listing ever began: jurisdictions became aware that they were being screened and assessed, and began adjusting their behavior along at least one dimension (IF membership) before the initial grey/blacklists were released. This complicates the choice of a treatment and control group in a DiD framework, as well as the reliability of the standard parallel-trends assumption: by the time the grey and blacklisting began, jurisdictions have had ample time to sort themselves out of the treatment. As a result, for most of the outcomes I do have panel data for (IF membership, MLI adoption and MAA membership) show pretty clear evidence of pre-trends when examining the impact of the listing using an event-study framework.[20] The one outcome that does not display clear pre-trends, CbCr commitment, at best shows small long term effects of a 10-15% percentage point increase.[21].

5 Discussion

5.1 Impact on the composition of the IF membership

One of the few consistently-robust results from the above exercise is that the EU review process and the threat of the blacklist has had a positive impact on the probability that affected jurisdictions join the Inclusive Framework.

How different is the Inclusive Framework thanks to the EU's efforts? One limitation of the RD approach is that, while the impact of the review process had at least an estimate impact of around 70% percentage points in membership around the threshold in the RD

[20] Not shown, but available upon request.
[21] See Figure A4 in the Online Appendix

specification, we are unable to say much about the impact on jurisdictions away from that threshold.

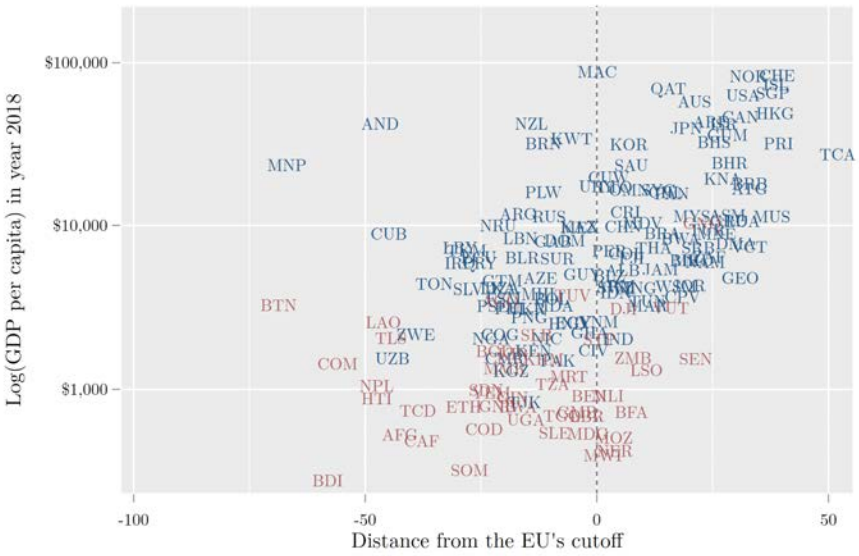
We can, however, take the ITT estimates from the difference-in-difference estimation as a tentative lower bound of the effect of the EU selection on Inclusive Framework membership. At the time of writing, the IF is currently considering the implementation of two major reforms to international tax rules. The first of these, Pillar I, aims to reallocate taxing rights over non-routine profits to market jurisdictions, based on sales in those jurisdictions. Pillar II aims to establish a global minimum tax regime. As of early 2020, the IF has endorsed framework for Pillar I but has yet to finalize the design of Pillar II. The ongoing COVID-19 Pandemic has led to a postponement of the next Inclusive Framework meeting from the summer of 2020 until October.

Let us ponder, for a moment, the impact a EU-driven 30% increase in the probability of Inclusive Framework membership would have had on the membership. Out of 137 members of the Inclusive Framework, 27 are EU members, and 36 are non-EU jurisdictions that were not selected for review. This leaves 74 jurisdictions that were reviewed by the European Union. A 30% increase in IF take up implies that roughly 17 jurisdictions joined the Inclusive Framework directly as a result of the peer review process.

Back of the envelope calculations suggest that this has not led to a large shift in the composition of the Inclusive Framework. For example, assuming no heterogeneity in the EU selection treatment effect, the average GDP per capita (in nominal 2018 dollars) for an IF member is only $370 lower than it would have been withou the EU's involvement. The average Tax Justice Network Financial Secrecy Index value of IF members is currently 291, versus 288 in the counterfactual. The EU review and listing process has made the IF more representative of poorer countries and those who potential contribute to global profit shifting, but only slightly.

The EU made two choices in designing its review process that have arguably had a large impact on the IF's composition. The first is in the setting of its thresholds for selection into the review process. The median GDP per capita, in 2018 nominal dollars, of jurisdictions within 10 percentile points of the cutoff is approximately $4,200. The second is excluding least developed countries (LDCs) from the review process. Taken together, a significant number of developing countries that might have been induced to take part in the Inclusive Framework are left out of the current negotiations. One of the factors that led the EU to exclude LDCs and set thresholds where it did was the fact that many developing countries do not currently have the capacity to implement the BEPS minimum standards. However, while it is not clear that the EU review process would have led the same pressure to join as it did for many tax havens, one potential benefit ceded by the design of the review process was greater involvement in the IF by developing countries. As there is an ongoing debate as to whether the design of Pillar I will lead to greater taxing rights for developing countries, the relative lack of representation of these countries in the Inclusive Framework remains an issue, as does the level and possibility of meaningful participation by these countries once they have joined up (Christians and

Figure 8: GDP per capita and distance from the EU's selection threshold



Notes: LDCs are highlighted in red. GDP per capita is measured in current, nominal dollars.

Van Apeldoorn 2018; Hearson 2020).

5.2 Eliminating harmful tax regimes

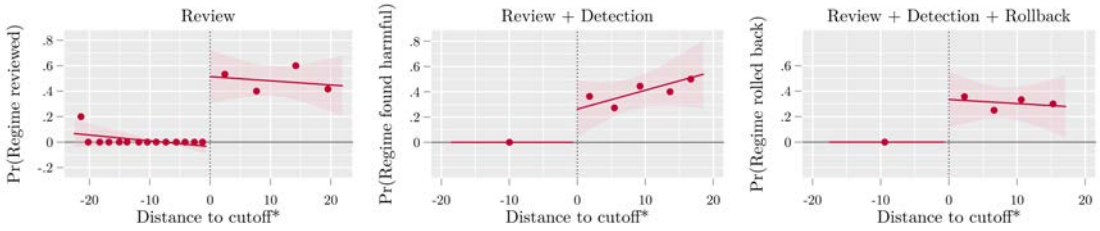
One important outcome of the BEPS process and a focus of the EU listing effort is the reduction of harmful tax practices. The results in the previous section suggest that the EU selection and listing process led to an increase in the number of jurisdictions that have been cleared of any harmful tax practices. But what impact did it have on the actual number of harmful regimes that were overturned?

The EU claims that "over 120 harmful regimes have been eliminated worldwide, thanks to the EU listing requirements."[22] This is a difficult assertion to test, due to the way we observe the presence of harmful tax regimes. Currently, the data only allow us to observe the evolution of harmful regimes that are reviewed by the EU COCG and the OECD FHTP, but not those that were not subject to review. It is impossible to know the precise impact of the EU's efforts without observing the entire universe of regimes across all jurisdictions, as some jurisdictions that were not selected may have chosen to amend or abolish harmful tax regimes. The EU's statement is based on the decisions by reviewed or listed jurisdictions to comply, but we don't know what compliance would have looked like in a world in which those reviews would not have taken place, because we would not have been able to observe it. This complicates our ability to say anything concrete about the causal impact of the EU process on the number of harmful regimes that have been rolled

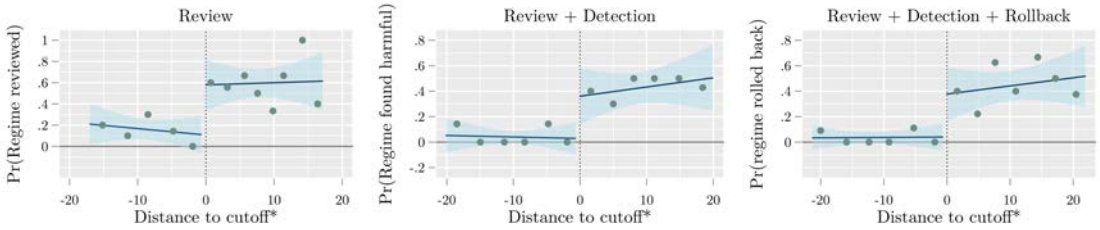
[22]Source: https://ec.europa.eu/commission/presscorner/detail/en/ip_20_262

Figure 9: The impact of EU selection on the probability of detection and rollback of harmful regimes

(a) Reviews conducted by the EU Code of Conduct Group



(b) Reviews conducted by the OECD Forum on Harmful Tax Practices



Notes: Each figure shows the results of a local linear regression-discontinuity estimate, without controls, of the (reduced form) effect of crossing the EU selection threshold on the probability a jurisdiction has at least one preferential regime reviewed, the probability that at least one harmful regime is detected during a review, and the probability that at least one regime has been rolled back after a review. Panel (a) uses data solely on reviews conducted by the EU's Code of Conduct Group. Panel (b) uses data solely on reviews conducted by the OECD Foreum on Harmful Tax Practices. Running variable is the multidimensional cutoff described above. 90% confidence intervals shown. Bins chosen using mimicking variance evenly-spaced (ESMV) method (Calonico, Cattaneo, and Titiunik 2015).

back, either using the regression discontinuity framework or even exploiting changes over time.

Stepping away from the net impact of its own review process, I can safely say that whatever the impact the EU exercise has had on the number of harmful regimes struck down, it extends beyond the efforts of the Code of Conduct Group itself. To illustrate this, consider Figure 9, which shows that crossing the multidimensional cutoff significantly increases the probability that a jurisdiction is (i) reviewed, (ii) is reviewed and has at least one harmful regime detected and (iii) is reviewed and rolls back at least one harmful regime that was detected in a review. The Figure shows the results separately for reviews conducted by the EU Code of Conduct Group (Panel A) and the OECD Forum on Harmful Tax Practices (Panel B). Fuzzy RD results with bias-correction and controls are presented in Table 4. The results indicate that selection into the EU review-and-listing exercise led to an increase in the probability of review by both the EU COCG and the OECD FHTP by roughly the same degree. If anything, the effects on the probability of OECD FHTP are slightly stronger. Results for the detection of harmful regimes and rollbacks of regimes are not generally significant, but consistent with a world in which the EU's review process led to a crowding in of effort by the OECD.

This is likely generated by the fact that the EU exercise sharply increased the proba-

Table 4: Impact of EU selection on probability of detection and rollback of harmful regimes

	Jurisdiction reviewed				Harmful regime detected				Harmful regime rolled back			
	(1) EU	(2) EU	(3) OECD	(4) OECD	(5) EU	(6) EU	(7) OECD	(8) OECD	(9) EU	(10) EU	(11) OECD	(12) OECD
Selected by EU	0.638***	0.628***	0.737***	1.140***	0.393*	0.271	0.360	0.125	0.342	0.0644	0.426*	0.317
	(0.179)	(0.203)	(0.188)	(0.190)	(0.224)	(0.267)	(0.243)	(0.248)	(0.233)	(0.255)	(0.234)	(0.291)
Controls		X		X		X		X		X		X
Observations	194	175	194	175	194	175	194	175	194	175	194	175

Notes: Outcome is = 1 if jurisdiction has had at least one regime reviewed by an entity, whether it had at least one regime reviewed and at least one harmful regime was detected, and whether it had at least one regime reviewed and at least one regime was rolled back. Results are divided by whether the reviewing entity was the EU Code of Conduct Group (COCG) or the OECD Forum on Harmful Tax Practices (FHTP). Results use the multidimensional running variable. Coefficient is estimated impact of selection into the EU review process on a different outcome, using bandwidth-selection, bias-corrected, robust methods outlined in Calonico, Cattaneo, and Titiunik (2014), Calonico, Cattaneo, and Farrell (2018) and Calonico, Cattaneo, Farrell, and Titiunik (2019).
$^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$

bility of a jurisdiction joining the Inclusive Framework, which itself leads to a review by the FHTP. A reasonable lower bound of the net effect of this spillover can be constructed if we make some basic assumptions about the impact of IF membership on the detection of harmful tax regimes. Currently, the latest report from the Inclusive Framework on the review of harmful tax practices revealed that roughly 175 regimes were found to be harmful or were amended too not be harmful, or have been abolished or are in the process of being so.[23] That suggests that for each IF member, $\frac{175}{137} \approx 1.3$ harmful tax regimes are detected and amended or struck down. If the EU review process led to 17 additional jurisdictions joining the IF, this implies - holding the detection rate constant - that an additional 22 regimes, or 14% of the total reviewed by the FHTP, were detected and reformed as a result. This is a lower band for two reasons: I am using the lowest bound estimate of the impact on IF membership and I am not counting any additional impacts the EU listing process may have had beyond the increase in IF members, such as the efforts by the COCG.

5.3 Limitations of the RD approach and possible heterogeneity in treatment effects

One potential limitation of the research design in this paper is the fact that a regression discontinuity design is useful for identifying effects in the immediate area of the cutoff. This allows me to identify what happens when there is a large, discontinuous change in EU pressure for otherwise-similar jurisdictions.

But there are reasons to believe that treatment effects may differ as jurisdictions move up the rankings across the three dimensions established by the EU. For one, jurisdictions with a higher ranking on 'strength of ties' and 'financial activity' are both more likely to have a large impact on the tax base of EU member states and are more financially

[23] https://www.oecd.org/tax/beps/harmful-tax-practices-peer-review-results-on-preferential-regimes.pdf

dependent on those same member states. This means, conditional on being selected into the EU review process, it is possible that the EU applied more pressure behind the scenes on highly-ranked jurisdictions to improve their practices. It is also possible that the stakes were higher for these jurisdictions and so they were more likely to react to EU pressure. If the thresholds for the EU's selection were set too 'low,' it is possible that the effects identified in the RD framework miss out on these additional effects.

We cannot observe behind-the-scenes effort, but we do observe effort by the EU on one dimension: the review of potentially harmful tax regimes by the Code of Conduct Group (COCG). Figure 10 displays the probability of a jurisdiction having at least one regime reviewed by the COCG between 2015-2019 as well as the unconditional probability of a jurisdiction having at least one regime found to be harmful by the COCG. It shows this across both of the main running variables I use in this paper (the MD and SF cutoffs, panels (a) and (b)) as well as across the jurisdiction's 'strength-of-ties' measure (panel (c)) for jurisdictions that were selected into the EU review.

For the multidimensional cutoff, there is not strong evidence that the EU focused more on jurisdictions away from the cutoff point than those close - if anything there is a slight decline for those furthest from the cutoff. For the SF cutoff, there are substantial increases in the probability a harmful regime is found for those further for the cutoff. However, these relationships are merely suggestive: the impact of EU selection is not identified far away from these cutoffs, so it is impossible to know if these increases in review rates would have happened regardless of the selection process.

One potential counterfactual is the probability of review by the OECD Forum on Harmful Tax Practices (FHTP), which could, far away from the cutoff, represent the 'status quo' of how likely it is a jurisdiction would be reviewed if the EU had not been involved. This counterfactual is imperfect because, as shown in previous sections, we know that the EU nudged many jurisdictions into the Inclusive Framework, which dramatically inreased the probability they would be reviewed by the FHTP. But it is still worth investigating how FHTP effort behaves further from the cutoff: in most cases we see it tracking or exceeding that of the EU. This relationship even holds if we focus directly on the EU's strength of ties measure. If the EU was exerting more effort on jurisdictions with closer ties to the EU, they were not doing so significantly more than the OECD.

5.4 Possible limitations of the EU listing process

In the long run, jurisdictions that have joined the Inclusive Framework will eventually need to improve their tax governance, unless these efforts are superseded by the recent efforts by the OECD to establish new ground rules under Pillars I and II. While this analysis cannot fully rule out small improvements, in the medium term, it does not appear that the EU's review and listing exercise has led to substantive changes in international tax governance for the group of jurisdictions that were originally targeted.

Why might this be the case? There are a number of reasons why the whole listing

exercise may not have had a large impact.

Slow movement on EU-specific countermeasures

As described in Section 2, the EU stipulated a number of potential countermeasures that could be applied to listed jurisdictions. This included preventing EU funds, such as those from the EFSD and EFSI, from being channeled through entities in listed jurisdictions. While there was push-back from the European Parliament and from civil society groups on European Investment Bank funds being channeled through tax havens in the years leading up to the introduction of the new blacklist, it is unclear at this point in time what proportion of investment funds actually followed this route. Thus it is hard to know whether these restrictions are likely to have been damaging for listed jurisdictions.

When the blacklist was first released in late 2017, EU member states also agreed to increase transaction monitoring and audits for transactions and taxpayers associated with listed jurisdictions. However, it is unclear to what extend these practices were actually implemented. More recently, member states have committed by the start of 2021 to implement more stringent legislative measures for blacklisted jurisdictions such as controlled foreign company (CFC) rules or withholding taxes. Also, as discussed before, EU member states have begun to exclude firms with subsidiaries in tax havens from COVID-19 relief programs, suggesting that there is growing political support for harsher counter-measures. It is thus possible that the EU blacklist will increase in its effectiveness over time, even if its impacts were more muted during the period studied in this paper.

Policy disharmony

The introduction of the pan-European blacklist never displaced the use of separate blacklists by each member state. For example, the Netherlands maintains its own blacklist of jurisdictions which have corporate tax rates of below 9%, which it uses in the implementation of controlled foreign company (CFC) rules. As of the end of 2019, the Dutch list comprised 15 jurisdictions *in addition* to the EU's blacklist. France also maintains its own list, but also includes jurisdictions blacklisted by the EU.

There are two ways in which mismatches between individual member state lists and the EU-wide list might undermine the observed impact of the latter. First, if EU member states decide to sanction a significantly larger group of jurisdictions than what appears on the EU list, then these jurisdictions, despite being in the 'control group' with respect to the EU list may also be reacting by improving their international tax governance. Second, the greater the disharmony between the two lists, the more likely it is that EU member states will put greater priority on imposing counter-measures on jurisdictions featured in their own list,[24] further weakening the additional impact of the EU blacklist.

[24] Although this too should improve in 2021 as new, required countermeasures are implemented.

Unequal enforcement and moving deadlines

While the EU has made its criteria for evaluating compliance clear, in practice it uses substantial discretion in choosing which jurisdictions are upgraded to its black list. In some cases these are due to extraordinary circumstances, such as eight Caribbean jurisdictions which were given extra time after they suffered a series of devastating hurricanes in mid-2017. It also, for greylisted countries, typically agrees on a timeline for improvement. Target dates for implementing new tax governance measures can be as far as a year into the future, somewhat dampening the urgency behind reform. By contrast, the Financial Action Task Force gives jurisdictions very short time frames (three months at a time) to improve their anti-money laundering standards, when considering their inclusion or position on their grey and blacklists, which gives governments much less leeway to dilly-dally.

One area of discretion by the EU has proven to be particularly awkward. To date, the United States has failed to implemented a reciprocal form of AEOI. With the Foreign Account Treaty Compliance Act (FATCA) already in place, the US already obtains global taxpayer information on its residents and nonresident citizens, reducing the benefits from implementing CRS (Noked 2019). But while FATCA provides obvious benefits to the US, the lack of reciprocity in most of its inter-govermental agreements means that FATCA doesn't provide the EU with the information it would obtain through the CRS.

At the time of writing, the US has failed to meet the deadline set by the EU to implement CRS with little in the way of obvious consequences. In October, 2019, the EU agreed that "the network of exchange of information arrangements with the United States is sufficiently broad to cover all EU member states," suggesting that the EU is backing down off of its decision to impose CRS adoption. However, if the EU decides to impose stronger, FATCA-style countermeasures on the US in the future (such as mandating imposing witholding rates on outgoing payments), then it is possible that the blacklist will be taken more seriously by all involved.

The case of the US illustrates another potential problem with the EU list: many, particularly those in civil society, have pointed out that the EU blacklist does not include several jurisdictions that likely still contribute to profit shifting and financial secrecy globally (Tax Justice Network 2020).

5.5 Lack of subzstantive economic impacts for listed jurisdictions and worldwide improvements in standards

Recent, comprehensive data on the operations of EU firms is still forthcoming so it is difficult to know whether there has been an EU-specific reduction in investment in or through these jurisdictions. A recent study by (Rusina 2020) finds that stocks of firms with subsidiaries in blacklisted tax havens fell after the initial publication of the the blacklist in December 2017. However, initial data on foreign direct investment from UNCTAD or on offshore assets from the Bank of International Settlements do not suggest there has been a

significant response to the EU review process of subsequent blacklisting.[25] This suggests that either the economic impact for blacklisted jurisdictions is small, or that jurisdictions with the most to lose from the listing made an effort to comply early (however, this latter explanation would have shown up as a treatment effect from the EU review process).

Another explanation is a general trend of improvement on international tax standards, outside that being driven by the EU's efforts. Adoption of the BEPS minimum standards and AEOI is driven by a number of factors ranging from multilateral pressure from the OECD, bilateral pressure from trading partners, and reputational issues that extend beyond the EU blacklist. It is possible that these trends leave less room for any additional impact of the blacklist.

6 Conclusion

In this paper I have considered the impact that the European Union's review and subsequent listing of jurisdictions for noncompliance with tax governance standards has had on that compliance. In summary, using a regression discontinuity framework, I limited evidence that the EU review process led to large improvements on tax governance outcomes, outside the impact it has had on transparency around harmful tax regimes. I do find strong, significant and persistent effects of the EU's efforts on membership in the Inclusive Framework, an important outcome for both the detection of harmful tax practices by the OECD and for the ongoing deliberation of international tax frameworks.

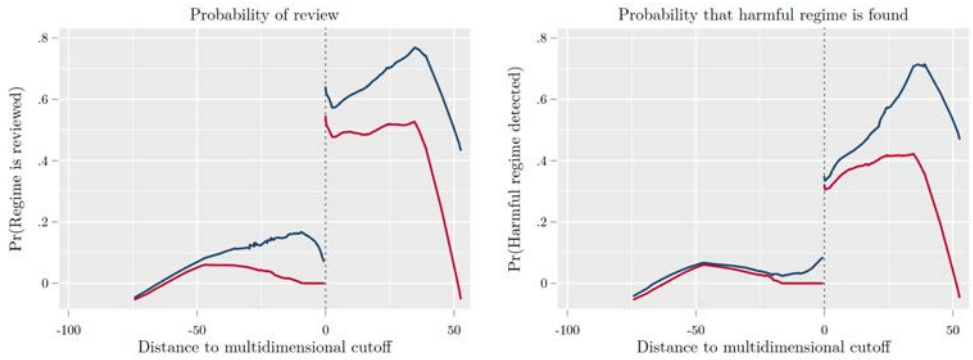
This study highlights the limitations of efforts by regional bodies to unilaterally pressure other governments into changing their laws, particularly when those efforts are not accompanied by clear, visible counter-measures. While the EU has clearly had a positive impact on the progress towards better international tax governance, the lack of sizable effects across many dimensions suggests that these efforts need to be reassessed to ensure a higher level of impact and, perhaps, credibility.

It also highlights the need for institutions like the EU and the OECD to do a better job at collecting and releasing data on the policy actions they care most about. Most of the data in this paper was painstakingly assembled by the author from existing reports. Detailed, machine-readable, time-specific data on the implementation of tax governance outcomes would allow for other forms of identification (e.g. difference-in-differences) to be used across all the outcomes of interest.

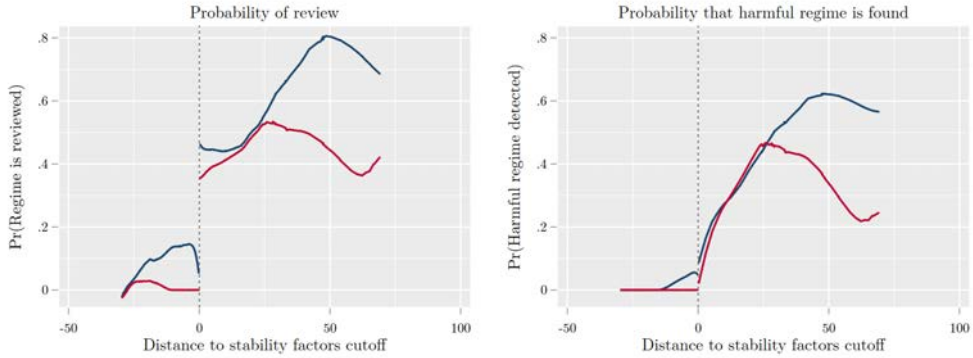
[25] Analysis available on request.

Figure 10: EU effort in reviewing and detecting preferential regimes does not appear to exceed that of the OECD as we move further away from the cutoff

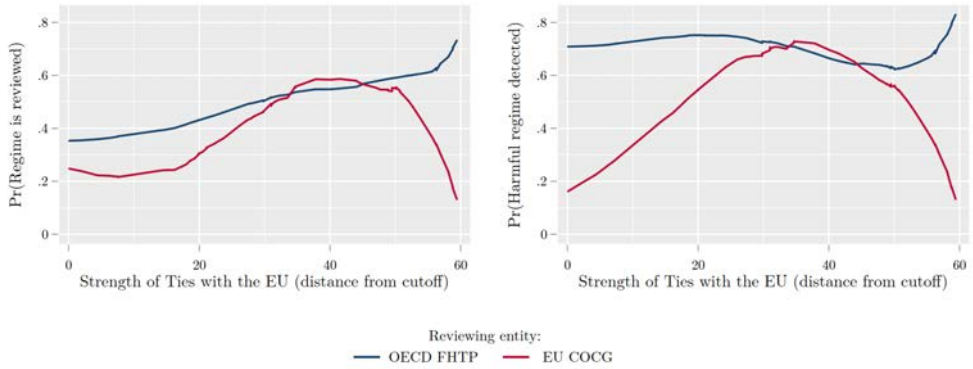
(a) EU scrutiny relative to OECD scrutiny, by jurisdiction's multidimensional (MD) score



(b) EU scrutiny relative to OECD scrutiny, by jurisdiction's stability factors (SF) scores



(c) EU scrutiny for selected jurisdictions compared to OECD scrutiny, by jurisdiction's score on "Strength of ties" measure



Notes: Each figure shows the results of a lowess regression of the probability a jurisdiction has at least one preferential regime reviewed by the EU COCG or the OECD FHTP (or a harmful regime detected) on that jurisdiction's (a) score on the multidimensional running variable, (b) its score on the stability factors running variable and (c) that jurisdiction's strength of ties score, conditional on being selected by the EU.

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