# The general anti-avoidance rule

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## Abstract

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**Abstract**

The general anti-avoidance rule, or GAAR, is an enforcement mechanism that gives a country's taxing authority broad power to deny a taxpayer tax benefits associated with any transaction. Although a GAAR being enacted within a country is becoming increasingly more common, the presence of a GAAR is generally overlooked and thus its effect left unstudied. In this paper we provide an initial investigation by studying the effect that a GAAR within a country has on corporate tax avoidance behaviors. Using an indicator for the enactment of a GAAR within a specific country, we find a statistically and economically significant increase in aggregate tax collections and a statistically and economically significant decrease in firm-level tax avoidance. Additional analyses show that the firm-level results are strongest for firms with higher levels of tax avoidance, for countries with lower levels of tax enforcement prior to the implementation of a GAAR, and for countries where the burden of proof lies, at least partially, with the taxpayer. In final analyses, we find that the GAAR is associated with a decrease in the volatility of reported ETRs.

# 1    Introduction

The general anti-avoidance rule (hereafter, GAAR) is an enforcement mechanism that gives the taxing authority of a country broad power to deny a taxpayer tax benefits associated with any transaction. Although the powers are broad, the intended target of these powers are those transactions that have no substantial purpose other than achieving a tax benefit. As the GAAR is a mechanism to curtail tax abuse, the OECD has increasingly advocated for its use while the EU has called on member states to uniformly adopt a minimum standard domestic GAAR (Ernst&Young 2013). However, despite the growing interest in the GAAR and their increasingly widespread adoption around the world, these rules and their impact have largely been ignored in the international tax and accounting literature. This paper aims to begin that investigation by examining the effect a GAAR has within a country on both aggregate income tax revenue collections and firm-level tax avoidance behavior in the pooled, cross-section.

To better understand the intended purpose of enacting a GAAR within a country, consider the following. Generally, taxpayers arrange their affairs in such a way that enables them access to varying levels of tax benefits. While many of these transactions are for legitimate non-tax reasons, others can be undertaken exclusively for tax benefits and therefore contain no substance apart from the potential tax advantages. Additionally, taxpayers may exploit tax law loopholes by structuring transactions to achieve tax benefits that were unforeseen when the tax law was enacted. In these situations, a GAAR provides a tool by which the tax

authority may deny a transaction's tax benefits by looking past the form of the transaction (which are likely intentionally structured to follow the letter of the law) to its substance (or lack thereof). In addition, the GAAR can serve as a means by which the tax authority can challenge claimed tax savings unintended by the tax law or that the tax authority feels are out-sized, but for which they lack a separate, relevant enforcement tool. Through these channels, the GAAR is a means to limit tax avoidance.

Despite this intuition, there are also many reasons corporate tax avoidance would be insensitive to a GAAR or why we might fail to find an observable effect. First, the enactment and application of a GAAR is often intertwined with judicial action and review, thus potentially making the effectiveness of the GAAR less reliant on the tax authority's use of it, and more on how the courts interpret and respond to it. For example, Poland enacted a GAAR beginning in 2003. However, by May 11, 2004, the Polish Constitutional Tribunal had ruled the Polish GAAR to be unconstitutional and repealed the new law.

Second, even when judicial review looks favorably upon the GAAR, the tax authority may be unable to effectively wield it as determining which transactions to apply the GAAR to, or to what extent those transactions should be disallowed, may not be readily apparent. For example, it is not always easy to distinguish genuine transactions consummated in a tax efficient manner from creative devices used for avoiding taxation. This is especially important as strategic tax planning is largely permissible in all jurisdictions and thus one often needs to take a holistic view of all parties, all taxes, and all costs (Scholes et al. 2009) which includes all transactions and positions when evaluating the appropriateness or legitimacy of a specific

transaction. In addition, the effectiveness of this determination is likely to be affected by which entity, the firm or the government, carries the burden of proof in the court of law.

Third, irrespective of tax-related laws in place, the average firm may, by default, refuse to engage in behaviors that aggressively reduce their tax to avoid the non-tax costs associated with such actions (see Hanlon and Slemrod 2009 and Mills et al. 2013). As the GAAR may only be invoked when firm-specific tax-related transactions result in benefits that are out-sized or which lack a purpose other than the sought after tax advantages, the average firm may not view the GAAR as a threat to their current tax avoidance behaviors and thus not alter their actions when faced with its enactment. This would leave little room for a GAAR to have an effect and would thus hinder the researcher's ability to observe an impact in pooled, cross-sectional tests. Additionally, it is possible that the average firm, regardless of the level of tax avoidance, does not take the GAAR into account when making tax planning decisions. In fact, an EY webcast poll reported 30% of participants did not address the GAAR within their tax risk management approach (Ernst&Young, 2013).

Of slightly more nuance, when faced with greater enforcement firms may behave like high-income individuals and seek additional means (whether transactions or strategies) of tax avoidance to obtain the targeted after-tax results after a full resolution with the tax authority (Slemrod et al. 2001). For example, similar to the audit-related argument in Slemrod et al. (2001), the enactment of a GAAR may act to highlight the strength of the enforcement regime and thus induce firms to seek higher and more effective levels of tax avoidance. Alternatively, firms at the high end of the tax avoidance spectrum may be

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unaffected by tax enforcement strength. This finding would be consistent with the negative coefficient depicted in Figure 2 of Hoopes et al. (2012), which provides evidence that a higher likelihood of tax audit may be irrelevant to the most tax aggressive firms. Similarly, PricewaterhouseCoopers LLP (2004) states: "[i]n a number of countries the final agreement of a tax return often ends in a 'horse trade' between the taxpayer and the relevant revenue authority." Therefore, aggressive taxpayers may create multiple aggressive positions with which to engage in such a trade, thereby enabling greater room for negotiating with the tax authority. In this case, the enactment of the GAAR might even increase tax avoidance.

In whole, all of these reasons indicate that whether or not a GAAR will be applied, how far-reaching that application will be, and how the taxpayer will be affected by or respond to its enactment is not without tension. Thus, whether or not a GAAR has an observable effect on tax avoidance remains an open, empirical question, the answer to which interests researchers and policymakers alike.

In addition to the lack of empirical research on the GAAR, we are motivated in our investigation for two additional reasons. First, we are motivated by the lack of studies that investigate specific mechanisms by which effective tax enforcement is accomplished. For example, US studies on tax enforcement focus mostly on the effects of audit probabilities, leaving other mechanisms under-investigated. In addition, most international studies rely on rough country-year indices or tax administration budgets and thus do not provide evidence on the effectiveness of specific tax enforcement mechanisms. By examining the effect of the

GAAR as one specific enforcement mechanism, we shed new light into the tax enforcement black box.

Second, although the oldest GAAR has been around for some time, we are also motivated by the recent increasing popularity of the GAAR. For example, the multilateral instrument (MLI) developed by the OECD as part of the base erosion and profit shifting (BEPS) project has recently brought increasing, global interest to these rules. Of the many provisions of the MLI, one of the most important is the general anti-avoidance provision — the so-called principal purpose test (PPT) — in article 7(1), which was adopted by signatories to the MLI and went into full force on July 1, 2018. In addition, the EU Anti-Tax Avoidance Directive contains five legally-binding anti-tax-abuse measures, including a general anti-avoidance rule, which all member countries began applying by mandate on January 1, 2019. Although our sample shows (and necessarily focuses on) countries that adopted a GAAR significantly before and irrespective of these initiatives, our test results help document the effect of the GAAR at the country-level and are thereby informative to the governmental and taxing authorities of other countries in evaluating the effects of implementing a GAAR.

We begin our analysis by providing evidence that the GAAR is associated with an increase in tax revenue collections in the aggregate. For the dependent variable we use corporate tax collections as a percentage of GDP. As the main independent variable of interest here and in later tests, we use a binary variable set equal one for the country-years after which either an initial GAAR is enacted or, in the case of some countries with a long tradition of a GAAR, significant changes are made to strengthen an existing GAAR, and zero otherwise.

We hand collect information on the implementation of GAARs by country. We also include several controls shown to affect tax avoidance in prior literature. We find evidence that the GAAR is associated with a statistically significant increase in corporate tax revenue collections. Additionally, we find that the GAAR is associated with a reduction in aggregate tax avoidance, as measured using median country-year effective tax rates.

We next perform a series of pooled, OLS tests at the firm-level using a broad cross-country sample. In these analyses, we find that the GAAR is associated with a statistically and economically significant decrease in tax avoidance at the mean, where tax avoidance is measured using reported ETRs. This is consistent with our findings in the aggregate using corporate tax revenue collections and median country-level tax avoidance and provides evidence that the GAAR is effective at curbing both aggregate and firm-level tax avoidance. Furthermore, as the enactment or strengthening of a GAAR is largely exogenous to a specific firm's activities, this result and its effect can be interpreted without issues regarding reverse causality and endogeneity.

After establishing this initial baseline for the effect of the GAAR in the pooled, cross-section, we next provide a host of cross-sectional analyses that further investigate the effects of the GAAR. Although it is interesting that we observe an effect in the pooled, cross-section of firms, the application of the GAAR by a tax authority is most likely to directly impact tax avoidance at the aggressive end of the tax avoidance spectrum. Accordingly, we investigate if there is a differential effect for firms engaged in more aggressive tax planning relative to their peers. Consistent with this expectation, we find that firms with greater

levels of tax avoidance prior to the enactment of the GAAR experience a greater reduction in tax avoidance after the GAAR is enacted, relative to those firms with lower levels of tax avoidance.

Next, we investigate whether the enactment of a GAAR has a differential effect depending on the prior perceived strength of tax enforcement within a country. For example, economies with strong tax enforcement prior to the enactment of the GAAR may find a GAAR to be an effective, additional tool at their disposal. Thus, the GAAR would act to complement prior tax enforcement. However, as the GAAR is ultimately an additional law layered upon preexisting law, the GAAR might have little (greater) incremental effect when laws curbing tax avoidance are already strong (weak). Thus, the GAAR might act as a supplement to prior tax enforcement. Results of a regression model that includes an interactive effect between the GAAR indicator and prior low tax enforcement are consistent with the GAAR having a greater effect when prior tax enforcement is low, suggesting a supplementary effect.

Next, we investigate whether there is a differential effect depending on whether the tax-payer or tax authority bears the burden of proof. To our knowledge, ours is the first study to investigate a differential effect of a tax enforcement mechanism driven by who bears the burden of proof in the court of law. In regards to enforcement mechanisms, the burden of proof is especially relevant as it signals the party that has the greater judicial hurdle to overcome. In empirical analyses we find evidence that the effect of the GAAR is greater when the taxpayer bears, at least partially, the burden of proof.

We next investigate whether the GAAR effect is incremental to other tax abuse rules a country may employ, including controlled foreign corporation rules, transfer pricing rules, and debt manipulation rules. We continue to find that, after controlling for the country-year presence of these other tax policies, the GAAR is associated with increased corporate tax revenue collections and reduced tax avoidance, both at the aggregate country-level and in the pooled-cross section of firms.

Next, we investigate the effect of a GAAR on tax rate volatility. ETR volatility is often viewed as a measure of tax risk, therefore our results can be interpreted as evidence of the effect of the GAAR on firm-level tax risk. Providing answers to this question is important as firms may view the GAAR as increasing their tax risk. Specifically, the intentionally broad nature of the GAAR could be viewed as providing the tax authority carte blanche in regards to challenging otherwise legitimate tax-related transactions. However, in contrast, limiting the upper bound of tax aggressiveness might mechanically limit ETR volatility such that tax risk declines overall. In tests that investigate the effect of the GAAR on reported ETR volatility, we find evidence that supports the GAAR being associated with a decrease in that volatility.

We conclude with a host of robustness tests. In general, we find that our results remain robust to many alternative measures (using current ETRs or adjusting pre-tax income for extraordinary items and discontinued operations), alternative fixed effect specifications (excluding country fixed effects, including industry-year fixed effects with country fixed effects, or using only firm and year fixed effects), alternative samples (using a sample that includes

all countries for which we have GAAR-related data, regardless of the GAAR effective date, or limiting the sample to include only initial adopters), and alternative time frames (removing all firm year observations that report a change in accounting method or removing the years around the adoption of a GAAR).

This paper provides many important contributions to the literature. Specifically, it provides evidence of a broad effect of a GAAR on tax avoidance in the pooled cross-section, not just on the point estimate but also on the distribution. Documenting this effect is important as it provides evidence to both researchers and policymakers on an important and increasingly prevalent enforcement tool available to the tax authority. Thus, these results are helpful to policymakers in evaluating the effectiveness of a GAAR for their regime. In addition, our study provides direct evidence on a specific mechanism of tax enforcement largely left unstudied.

The rest of this paper is organized as follows. Section 2 discusses the relevant research and develops hypotheses. Section 3 provides our empirical framework as well as data and variable description. Section 4 presents the results of empirical tests, and Section 5 concludes.

# 2    Related Research and Hypothesis Development

Although tax enforcement is often treated as a single step and effect, it is, in actuality, a multi-faceted and multi-step process. Specifically, the typical enforcement procedure follows a process similar to the following: 1) a taxpayer engages in a set of transactions with varying

levels of tax benefits which are captured in tax and financial statements and disclosures, 2) with some level of probability, the tax authority audits the tax and/or statutory statements, disclosures, and positions claimed, 3) the tax authority comes to a determination regarding the taxpayer's positions, 4) the tax authority then uses relevant law and policies to challenge those tax positions with which it disagrees, and 5) a resolution is reached, either by court ruling or otherwise, which provides either a mutually agreed on or forced reconciliation of the positions of the taxpayer with the determinations of the tax authority.

Despite the intricacies of this process, extant research within the United States on the effects of tax enforcement has focused mainly on the effect of discovery via tax audits (e.g., El Ghoul et al. 2011, Hoopes et al. 2012, Hanlon et al. 2014) and thus on the second step of the process. However, strictly speaking, research on the effect of enforcement as proxied for by audit incidence and probability should be interpreted as the marginal effect that the increased probability of discovery has, keeping all other steps of the process and enforcement-related tools available to the tax authority constant, on a specific outcome (such as tax avoidance). As such, studies using the probability of audit discovery provide little evidence on the effect that changes in other enforcement tools have on that same outcome. Because the enactment of a GAAR broadens the tools available to the tax authority irrespective of the frequency of the audit discovery process, our study investigates and provides evidence on an aspect of enforcement significantly different from tax audit and discovery probability (i.e., the GAAR provides evidence related to the fourth step, and by backward reasoning the third step, rather than the second step).

Relatedly, the international literature that has studied the effect of tax enforcement (e.g., Dyck and Zingales 2004, Desai et al. 2007, Atwood et al. 2012, and Kerr 2019b) has relied primarily on a single index based on survey response to variations of questions such as "Is tax evasion a threat to your economy?" Therefore, while the measure used by the prior literature likely captures a general sentiment regarding tax evasion, it is likely that it only indirectly captures tax enforcement while providing no evidence on the specific mechanisms at play. A recent study by DeSimone et al. (2019) uses OECD data on tax administration spending as a measure of tax enforcement to document that increased tax administration spending is negatively associated with domestic tax avoidance. In contrast, our study distinctly illuminates aspects of the tax enforcement black box by providing evidence on a specific, ever growing and increasingly present tax enforcement mechanism.

Specific research on the effects of general anti-avoidance rules is both limited and nascent. For example, recent research by Johansson et al. (2017) investigates the role that various broad categories of country-level tax policies have on income shifting. Although that study focuses on policies and legislation that deal with the disclosure of transfer pricing, rules against debt manipulation, the capping of interest payments, and the degree of withholding tax rates, they also present results of a static country measure (computed once in 2005 and again in 2014) that includes the presence of controlled foreign corporation (CFC) rules and the presence of a general anti-avoidance rule. Through a set of two empirical regressions they find some evidence that these tax policies (what they term collectively as "anti-avoidance rules," though their use of the term should not be confused with the "general anti-avoidance

rule," or GAAR, used here or elsewhere) is associated with a lower level of profit shifting among their sample of multinational groups. Oddly, their results appear to be weaker (both in statistical significance and in economic strength) in the regression where they use a measure that includes the presence of both CFC rules and a GAAR, as opposed to limiting the variable of interest to only the policies dealing with transfer pricing, debt manipulation, and withholding tax rates. Although they do not provide a test of the difference in coefficients, the lower coefficient when the presence of a GAAR is included could imply that the presence of a GAAR works to increase tax avoidance, providing potential empirical support for the tension and arguments made above. Even if their reported coefficients are not statistically different, their study provides initial but limited evidence on the effect of a portfolio of anti-abuse measures on profit shifting (a specific type of tax avoidance) for multinational corporate groups. In contrast, our study exploits the staggered adoption of GAARs across countries to directly test the effect of the GAAR on tax avoidance.

Although it lacks empirical hypotheses and tests, Johansson et al. (2016) provides descriptive evidence on the specific tax policies and legislation used in the empirical tests of Johansson et al. (2017). Therefore, Johansson et al. (2016) serves as a jumping off point for Johansson et al. (2017) as well as provides insight for our own study. Accordingly, as research into the effects of the GAAR is limited, our study aims to provide ground-floor evidence in a broad international setting on this specific tax enforcement mechanism and its relationship with corporate tax avoidance as well as increase awareness of this important policy. In this vein, we look forward to future research that exploits the presence of a GAAR.

As the GAAR is a broad measure intended to disallow questionable tax compliance, our study is also related to research that investigates the impact of tax enforcement or enforcement-related changes on firm-level behavior. This literature has focused predominantly on one of two variables depending on the setting. For example, studies in a US setting rely predominantly on the frequency of IRS audits while those in the international setting use variation in cross-country tax enforcement. More specifically, the most commonly used empirical proxies in these two veins of studies are IRS audit incidence (based upon firm size grouping) from the Transactional Records Access Clearinghouse (TRAC) TracFed database and the tax evasion index from the IMD World Competitiveness Report, respectively.[1]

Research into the effects of IRS audit incidence include studies such as El Ghoul et al. (2011), Hoopes et al. (2012), and Hanlon et al. (2014) where audit probability is associated with lower cost of capital, lower tax avoidance, and higher quality financial reporting, respectively. In whole, these studies provide general evidence on the effect of tax enforcement, but do not provide evidence of the specific mechanisms at play. Similarly, studies that rely on private IRS audit data generally do little to shed light into the tax enforcement black box.

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[1]It is important to note a division in the international literature on specific measure of tax enforcement used in some studies. While a version of the index has continued to be supplied every year, historically, many studies have used the static 1996 version of the index (see Dyck and Zingales 2004, Desai et al. 2007, and Atwood et al. 2012). This is often done intentionally, though, as in their study Atwood et al. (2012) argue that the 1996 version better proxies for tax enforcement because of a subtle change in the survey question asked. Specifically, in 1996, respondents were asked how much they agreed with the statement: "Tax evasion is minimal in your country." However, since 1996, respondents have been asked how much they agree with the statement: "Tax evasion is not a threat to your economy." Despite this shift, other studies such as Kerr (2019b) use the newer versions of the index as it is a country-year measure with variation in the time series and thus allows for statistically stronger tests.

In the international sphere, the link between specific mechanisms of enforcement and tax avoidance is weaker as the proxies used for enforcement are often indirect proxies based on survey responses to statements such as "tax evasion is minimal in your country" or "tax evasion is not a threat to your economy." Regardless of which question survey respondents are responding to, using the tax evasion index as a measure of tax enforcement requires the researcher to assume that tax evasion is minimal or not a threat due to the level of tax enforcement and not due to other behavioral or economic forces. In addition, the index does not supply a direct link to the specific enforcement mechanism at work, leaving the black box of enforcement obscured. Regardless, though, research has found that the tax evasion index is associated with lower levels of private benefits of control (Dyck and Zingales 2004), lower levels of tax avoidance (Atwood et al. 2012), and greater incremental information content of tax surprise (Kerr 2019b), though Desai et al. (2007) fail to find that the tax evasion index affects the relation between corporate governance and taxes. Therefore, this study builds upon the findings in Atwood et al. (2012) by opening the black box of tax enforcement.

# 3   Empirical Framework

We obtain data for firm-level financial and accounting variables from the Compustat Global Fundamentals Annual and the Compustat North America Fundamentals Annual databases along with their intersection with the Compustat Security Daily databases. We use firm-year observations with necessary data for fiscal years ending between 1998 and 2017. The data

begins in 1998 due to the general lack of tax-related rate and financial data prior to that time. For firm-year tests, we limit our sample to those countries that enacted a GAAR or that enacted significant legislation that strengthened the GAAR during our sample period.[2] In addition, we limit our sample to firms within those countries with 1) non-missing, positive assets at both the beginning and end of year, 2) non-missing, positive pre-tax book income during the year, 3) non-missing control variables, and 4) consistent current and prior period reporting currency.[3]

We make a few notes regarding the decision to use, as our sample, both those countries that initially enacted a GAAR and those that enacted changes that significantly strengthened an existing GAAR during our sample period (which we collective term as "enacting a GAAR" throughout the rest of this study). First, we note that by coding periods following the strengthening of an existing GAAR as 1 and periods prior to that strengthening as 0, we are potentially discarding some of the GAAR-related effect. Although coding in this manner is likely to only bias against finding the effect we are interested in (thereby ensuring the strength of any effect we do find), we note that legislation to strengthen an existing GAAR

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[2]Although the United States has a long history of anti-tax avoidance judicial doctrines dating back to the 1930s and codified the economic substance doctrine in 2010 (Ernst&Young 2013), we do not include firms domiciled in the United States in our sample. This is due to the relative sample size of the United States compared to other countries. As it is, by far, the largest country, it could potentially bias our results. However, in untabulated analyses, we find that our results remain robust to its inclusion, with the exception being the volatility tests.

[3]We do not include non-GAAR countries as a control group in our main tests for two reasons. First, the limited sample size of firm-year observations within those countries with sufficient data to compute control variables is extremely limited (approximately 3% of the main sample size). Second, the inclusion of these countries also complicates the interpretation of the coefficient on GAAR given that our sample includes countries that both initially enacted a GAAR and enacted new legislation to significantly strengthen an existing one. Regardless of this choice for presenting our main results, we perform untabulated robustness tests that include these countries and find that our results continue to hold.

is likely to only occur if the existing GAAR is found to be ineffective. In this way, the effect of the GAAR prior to strengthening is plausibly similar to a lack of a GAAR (and thus a value of 0). Second, by constructing the sample in this way we are able to provide a good balance in the trade-off between focusing on the effect, and thus question, of interest while also ensuring adequate sample size, and thus power, in tests, the results of which can generalize broadly.[4]

To test the empirical predictions, we estimate pooled OLS regressions of the following form:

$$TaxAvoid_{i,t} = \gamma_0 + \gamma_1 GAAR_{i,t} + \beta Controls_{i,t} + Fixed\ Effects + \varepsilon_{i,t} \tag{1}$$

where $GAAR$ is the primary variable of interest and takes a value equal to one for the country-year presence of a GAAR, and zero otherwise. The dependent variable, $TaxAvoid$, is our measure of tax avoidance. We define tax avoidance similar to Hanlon and Heitzman (2010) as any activity that reduces a firm's tax liability per dollar of pre-tax earnings. Accordingly, $TaxAvoid$ is calculated using the reported GAAP (i.e., book) ETR. Specifically, $TaxAvoid$ is computed as the income tax expense for the year divided by pre-tax income, multiplied by negative one such that lower values of $TaxAvoid$ represent less tax avoidance.

We focus on the reported ETR, as opposed to other potential measures of tax avoidance, for several reasons. First, prior research shows that both management and investors focus on earnings over cash (see Sloan 1996). In addition, Armstrong et al. (2012) find that tax

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[4]In untabulated tests, we find that our inferences remain unchanged, though of slightly lower economic significance, if we use a full sample that includes all countries regardless of enactment year, or if we limit the sample to only that countries that had an initial GAAR enacted during the sample period.

directors (who are most likely to be concerned with the effects of a GAAR) are focused on the level of tax expense as reported in the financial statements as opposed to other measures such as cash taxes paid or the book-tax gap. Therefore, any response from management related to variation in enforcement might best be seen in an earnings-based measure (i.e., reported ETR) as opposed to a cash-based one (i.e., cash ETR).

Second, we note that total tax expense in the Compustat Global database is much more broadly available than other potential measures. For example, requiring current tax expense reduces the final data set size by over a third while requiring cash taxes paid reduces the final data set size by nearly two-thirds. Thus, focusing on total tax expense allows for our sample to have the greatest sample size, to have the greatest statistical power, and to be the most broadly generalizable. In untabulated tests, we find that our results remain robust to using the current ETR (calculated using current tax expense divided by pre-tax income).

Although we calculate the reported ETR similar to prior research that uses a US-only setting, our international sample has variation in the corporate statutory tax rate (CSTR) within countries across time (unlike a US-only setting which has seen little to no variation in the corporate statutory tax rate until recent history). Therefore, to ensure our results are not driven by cross-country fluctuations in the CSTR, we further modify the reported ETR in three ways. First, we use the unscaled *TaxAvoid* measure but include the CSTR as an additional control variable in the regression model. This allows the CSTR to take a value different from one, as opposed to including it as a scalar on the left-hand side. Second, we calculate the spread between the CSTR and the ratio of total tax expense to pre-tax income

(i.e., *TaxAvoid Spread*). We note that, algebraically, benchmarking in this way is identical

to the approach taken in Atwood et al. (2012) in measuring tax avoidance at the firm level

across countries. Third, we scale the *TaxAvoid* by the CSTR to allow for comparability

and remove differences in scale (i.e., *TaxAvoid Ratio)*. For all three measures, a lower value

of *TaxAvoid* signifies less tax avoidance. We obtain corporate statutory tax rates from the

Organisation for Economic Co-operation and Development (OECD) website for years 2000-

2017, from KPMG's online corporate tax rate table for years 2003-2017, from KPMG's annual

corporate tax rate survey for years 1998-2003, and from the Tax Foundation Github data

archive for years 1998-2015. Where available, we crosscheck rates across multiple sources to

ensure consistency in the inclusion of subnational taxes.

To determine our main variable of interest, *GAAR*, we manually search for and hand

collect data from multiple sources.[5] Our main sources include Ernst&Young (2013) and

Appendix 1 of Johansson et al. (2016). Where the information in those two documents

is missing or contradictory, we search for and find supplemental information including that

from Bloomberg Law (2009), International Law Office (2011),Nagato (2017), Deloitte (2017),

and Ernst&Young (2017). We summarize the effective dates, how we determine each date,

and the appropriate source documents in Appendix B.

We include a variety of both firm- and country-level variables drawn from the prior liter-

ature that have been shown to be associated with tax avoidance (e.g., Gupta and Newberry

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[5]For brevity, we do not distinguish between a GAAR or a GAAR-like provision and simply refer to them
collectively as a GAAR. A GAAR-like provision is essentially a GAAR by another name. For example,
Indonesian tax law established the principle of substance over form in 2009, enabling the tax authority to
re-characterize transactions that lack business purpose. For more information, see Appendix B.

1997, Rego 2003, Dyreng et al. 2008, Frank et al. 2009, and Wilson 2009). Specifically, we include firm-level controls for age (calculated as the logarithm of 1 plus Compustat firm age), return on assets (calculated as pre-tax income scaled by beginning of year assets), leverage (calculated as current and long term debt scaled by beginning of year assets), size (calculated as the logarithm of total assets), book-to-market ratio (calculated as the ratio of book value of equity to market value of equity), the presence of consecutive losses (calculated as an indicator variable set equal to one if the sum of pre-tax income for the current and prior year are less than zero), cash flow constraints (calculated as 1 minus the ratio of operating cash flows scaled by total assets at the beginning of the year), intangibles (calculated as intangibles scaled by total assets at the beginning of the year), PP&E (calculated as property, plant, and equipment scaled by total assets at the beginning of the year), and research and development expenditures (calculated as total research and development expenditures scaled by total assets at the beginning of the year). We also include country and year fixed effects to control for country- and year-specific factors that may not be controlled for elsewhere. In addition, we cluster standard errors by firm to account for the possible correlation of residuals. Finally, to reduce the influence of outliers, we winsorize all firm-level continuous variables at the top and bottom percentile. A detailed description of all variables can be found in Appendix A.

# 4  Empirical Results

In this section we present the results of all empirical tests. We start with aggregate country-level tests and then move to firm-level tests.

## 4.1  Effect on aggregate-level tax avoidance

We begin our empirical tests by testing our main hypothesis in the aggregate. To ensure sufficient power, we perform this test using all country-years regardless of whether the country enacted a GAAR during our sample period or not.[6] Using OLS regressions we test whether the presence of a GAAR results in reduced tax avoidance at the country-level. To do so, we use two different measures of tax avoidance. First, we use the amount of corporate tax revenues collected as a percentage of GDP (obtained from the OECD website). Using this measure is similar in spirit and intent to the aggregate test found in Kerr (2019a) which shows that increased country-level opacity results in an increase in the country-level corporate tax revenues collected. Second, to ensure comparability between this aggregate test and the subsequent firm-level tests, we also use the country-level median of each of the three firm-level measures of *TaxAvoid* detailed above.

We follow Kerr (2019a) and include a variety of country-level controls. Specifically, we include the presence of a worldwide tax system (obtained from Atwood et al. 2012 and, where

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[6]Untabulated tests using only those countries that enacted a GAAR during our sample period show a positive and significant effect of the GAAR on corporate tax revenue collections and a negative and weakly significant effect of the GAAR on median-level tax avoidance. Due to the low number of observations in these tests (n=176) we interpret the weak findings as a lack of power and thus use the full sample.

missing, EY's Worldwide Corporate Tax Guide 2017 and the Tax Foundation Special Report "A global perspective on territorial taxation"), the level of required book-tax conformity (obtained from Atwood et al. 2010), the anti-self dealing index (obtained from Djankov et al. 2008), an index of anti-director rights (obtained from La Porta et al. 1998), the level of ownership concentration (obtained from La Porta et al. 1998), and the civil law indicator obtained from Atwood et al. 2012 (where missing we use Central Intelligence Agency 2018).

Before presenting results of these tests, we present descriptive statistics for the variables used in this test. These descriptive statistics can be found in Table 1, Panel A, and indicate wide variation in country characteristics, including corporate tax revenue collections and investor protections rights.[7]

We next present results of the aggregate tests in Table 1, Panels B and C. We find that the results in both panels show a statistically significant decrease in tax avoidance at the country-level when a GAAR is in place. In terms of economic significance, the presence of a GAAR increases *CorpTaxRev* by roughly six to seven-tenths of a percentage point. We find this effect is robust to the inclusion of country fixed effects, and note that this effect is roughly double the effect documented in Kerr (2019a) related to increased transparency through the mandatory adoption of IFRS. In Panel C, the negative and significant coefficient on GAAR translates to a roughly two to three percentage point increase in reported ETRs.

[7]We note that Table 1, Panel A has a much reduced country composition than that which we present later in Table 3, Panel B when we move on to firm-level results. This reduction is due to the difference in the unit of observation as well as limitations in many different data items. For example, the main variable of interest is the amount of corporate tax revenues collected as a percentage of GDP. As this item is obtained from the OECD website, we immediately eliminate non-OECD countries. In addition, the need for additional control variables further limits the sample of countries that can be included in the tests.

## 4.2 Effect on firm-level tax avoidance

Next, we test the effect of the presence of a GAAR on firm-level tax avoidance. Once again, before presenting the results of this test, we present descriptive statistics useful in interpreting subsequent results. We present our firm-level sample selection procedures in Table 2. In the lower part of Table 2, we show the number of firm-years excluded due to each missing data item. We note that the largest exclusion is due to firms with missing or negative pre-tax income. This step is necessary, however, in computing reported ETRs.

In Table 3, Panel A, we present firm-level descriptive statistics for the variables used in the firm-level tests. As seen there, the sample of firms includes a wide variety of firms in terms of tax aggressiveness, profitability, leverage, size, age, and investment profiles.

In Table 3, Panel B, we present similar descriptive statistics, but do so by country. Again, the statistics shown illustrate the diversity of our sample as well as provide a sense of its country-by-country representation.

In Table 4 we present a correlation matrix of firm-level variables. Of interest here is that the GAAR is significantly negatively associated with our measures of tax avoidance. This provides initial evidence for our hypothesis that the GAAR acts to reduce tax avoidance.

The results of our main firm-level analysis are presented in Table 5. These results act as a baseline for the additional tests we provide in later tables. We present results using three measure of tax avoidance, *TaxAvoid*, *TaxAvoid Spread*, and *TaxAvoid Ratio*, as discussed

above and further defined in Appendix A. The results of these specifications can be seen as Columns 1 through 3, respectively.

As seen there, the indicator variable for the presence of a GAAR loads significantly and negatively in all specifications, implying that the GAAR has a significant negative effect on tax avoidance in the pooled cross-section. In terms of economic significance, our results indicate that the GAAR increases reported ETRs by at least two percentage points.

## 4.3   GAAR and tax aggressive firms

The results in Table 5 show a significant mean effect. However, it is unclear if this effect is being driven by a particular section of the distribution. Given that a mean effect is observed, it is our expectation that, due to the nature of a GAAR, the effect will be greatest for firms at the high end of the tax avoidance spectrum. We next test this supposition.

To do so, we create a firm-level indicator variable, *HI Avoider*, set equal to one when a firm's long run tax avoidance (computed using the long-run ETR over the three years preceding the GAAR effective date) exceeds the median long-run tax avoidance of all other firms in that particular country. Because the computation of *HI Avoider* requires at least three years consecutive years of ETR data for the years immediately preceding the GAAR enactment in a given country, our sample size decreases for these tests relative to others. We report the results in Table 6.

As shown in Table 6, we find that the effect of the GAAR is more pronounced on firms that had been at the higher end of the tax avoidance spectrum prior to the GAARs enactment.

Specifically, the interaction effect with the indicator for high tax avoidance is statistically and economically significant in the direction expected. Notably, we find that the standalone effect of the GAAR in all three specifications is insignificant. This suggests that the effects of the GAAR are focused on those firms with the greatest levels of tax aggressiveness.

## 4.4   GAAR and prior enforcement

We next test how the GAAR interacts with prior levels of enforcement. This test is informative because it shows whether the GAAR supplements or complements prior tax enforcement.

To create a measure of the level of tax enforcement in place prior to the presence of a GAAR, we create a country-level indicator variable to capture those countries with a lower degree of perceived strength of tax enforcement prior to the enactment of a GAAR. Specifically, we create a new variable, *LO Enforce*, set equal to one for countries with tax enforcement in the year prior to the enactment of a GAAR that falls below the median of tax enforcement of all countries in that sample year. We measure tax enforcement using the tax evasion index taken from the IMD World Competitiveness Report. The tax evasion index is based on responses to an executive opinion survey and measures respondents' perceptions regarding the strength of tax enforcement within a country. As *LO Enforce* is a country-static variable subsumed by country fixed effects, the standalone effect is excluded from the regression model.

We present results of this test in Table 7. As seen there, the interaction effect with the indicator for tax enforcement is statistically and economically significant. This implies that

the effect of the GAAR is strongest in countries where tax enforcement prior to the enactment of the GAAR is weakest. In addition, we find that the standalone GAAR indicator in two of the three specifications continues to have a negative mean effect (with slightly reduced economic significance when compared to Table 5), implying that, regardless of the strength of prior enforcement, the GAAR continues to have a significant effect.

## 4.5   GAAR and burden of proof

As discussed above, the effectiveness of the GAAR may be affected by which entity, the firm or the government, carries the burden of proof. In our next tests, we provide evidence in that regard.

Specifically, we create three new variables to measure which entity, the tax authority, the taxpayer, or both, carry the burden of proof. Specifically, we measure *Burden-Taxpayer* as equal to one when the taxpayer carries the burden of proof, and zero otherwise. In addition, we measure *Burden-Shared* as equal to one when the burden of proof is shared between the tax authority and the taxpayer, and zero otherwise. Finally, we measure *Burden-Taxpayer or Shared* as equal to one when the taxpayer bears any burden (solely or shared), and zero otherwise.

We present the results of tests on the effect of the burden of proof in Table 8. As seen there, the effect of the presence of a GAAR is greater when the taxpayer bears either solely or partially, the burden of proof. This suggests that the GAAR is more effective when the onus of proving the legitimacy of a transaction is on the taxpayer and not on the tax authority.

## 4.6 GAAR and other anti-avoidance rules

To test whether other anti-avoidance policies employed by a country mediate the relationship between GAAR and tax avoidance, we next include fixed effects to control for the country-year presence of controlled foreign corporation (CFC) rules, transfer pricing (TP) rules, and debt manipulation (DEBT) rules, as outlined in Appendix C. Table 9, Panel A reports results at the country-level, and provides evidence that the positive (negative) effect of a GAAR on corporate tax revenue collections (tax avoidance) is incremental to the effects of other anti-avoidance rules. Likewise, Table 9, Panel B reports results at the firm level. We find that after controlling for the presence of other anti-avoidance rules, the negative effect of the GAAR on firm-level tax avoidance persists, though at a slightly reduced magnitude compared to Table 5.

## 4.7 GAAR and ETR volatility

Next, we test the effect of the presence of a GAAR on the volatility of reported ETRs. Prior literature has used ETR volatility as a measure of tax risk. To measure ETR volatility, we take the standard deviation of reported ETRs over a rolling five-year window. Therefore, for a given firm-year labeled as t, we measure ETR volatility from t to t+4. All other variables are measured as the median over that same window. In addition, we exclude the five years

pre-GAAR for each country from the analysis to ensure that we avoid overlapping the pre- and post-periods in calculating the volatility measure.[8]

As seen in Table 10, we find that the presence of a GAAR is statistically and significantly associated with a decrease in reported ETR volatility. These results suggest that the GAAR decreases the tax risk of the firm.

## 4.8   Robustness

We perform a host of robustness tests to ensure the legitimacy of our interpretation of results.

First, although we limit our sample for the firm-level analyses to include only those countries that enacted a GAAR or enacted legislation strengthening a GAAR during our sample period, we also perform untabulated tests using a sample of all countries for which we have GAAR-related data (i.e., the full GAAR sample). We note that use of the full GAAR sample coupled with the inclusion of country and year fixed effects is akin to a difference-in-differences specification where the control group consists of countries that enacted the GAAR prior to the sample period and that had no legislative strengthening of the GAAR during the sample period. Here, the GAAR indicator represents the difference-in-differences estimator. Using this alternative specification, we find that our conclusions remain materially unchanged, though we note that the economic significance is slightly reduced. We also perform untabulated tests using a subsample of only those countries that initially enacted a GAAR during our sample period. Although this specification reduces our sample size by

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[8]In untabulated robustness tests, we find our inferences remain unchanged when we include the five-year pre-GAAR period.

over one half, our findings are generally robust to this alternative specification, with the exception of the Table 9, Panel B, where the coefficient on GAAR loses significance in one of the three specifications (although the sign of the coefficient remains negative). Finally, we perform our tests on a reduced sample that excludes countries with GAAR-like regimes (see Appendix B) and find our inferences remain unchanged (results untabulated).

Second, in untabulated robustness, we use the current ETR as an alternative measure of tax avoidance. The use of the current ETR results in a significant reduction in sample size due to missing current tax expense data in Compustat. Resetting missing values of current tax expense to the difference between total tax expense and deferred tax expense (when available) increases the sample size. Using this alternative measure of tax avoidance, we find that our results remain quantitatively and qualitatively similar, which the exception being the volatility tests. Related to this, given the severe sample attrition of requiring data sufficient for calculating a cash ETR, we do not use the cash ETR in our analyses.

Third, we include country fixed effects in our main tests to control for unobserved country level differences. However, as these effects might also subsume some of effect we are investigating, we perform an untabulated robustness test of our baseline findings that omits country fixed effects. We find that our main results are robust to this alternative specification. In addition, rather than including country fixed effects, we also perform all tests using firm fixed effects. We find that our results also remain robust to this specification, with the exception of the volatility tests in which two of the three models are insignificant. Additionally, because tax avoidance may systematically vary by industry, we perform untabulated

robustness tests that include country and industry-year fixed effects and find that all of our results persist.

Fourth, although we use the unadjusted pre-tax income as a scalar to calculate ETRs in our main tests, we also run additional tests using pre-tax income adjusted for extraordinary items and discontinued operations. In untabulated tests we find that our baseline results continue to hold and are slightly greater in magnitude using this alternative scalar.

Fifth, since Japan is the country with the largest representation in our sample, in untabulated robustness tests we exclude Japan from each test and find our inferences remain qualitatively unchanged.

Sixth, because our study uses a broad cross-country sample, it is possible that country-level changes in accounting policies may materially impact measurement of our accounting-based variables and thus our results. In untabulated robustness tests, we remove all firm year observations that report a change in accounting method, including IFRS adoption, such that for any given firm, the sample includes observations under only one accounting regime. We find our results are robust to this modification.

Seventh, we test whether the effect of tax enforcement spending impacts the negative relationship between GAAR and tax avoidance. In untabulated robustness tests, we find that our overall inferences regarding the positive (negative) effect of the GAAR on corporate tax revenue collections (tax avoidance) remain unchanged, when the percentage change in tax enforcement spending, following DeSimone et al. (2019), is included as a control. We do not perform this analysis for our cross-sectional firm-level tests as the tax enforcement

spending variable is a country-year measure (i.e., the same value is used for all firms in a given country-year), which causes concerns regarding collinearity with many of our country-level cross-sectional variables.

Finally, we perform untabulated tests in which both the year of GAAR enactment and the year immediately succeeding the enactment are excluded from the sample and find our results hold.

# 5 Conclusion

This paper provides evidence of the effect of the presence of a GAAR on both the level and distribution of tax avoidance. Specifically, it shows that the presence of a GAAR increases corporate tax revenues collected, decreases firm-level tax avoidance, and lowers firm-level ETR volatility (a measure of tax risk). We find that, although the GAAR appears to have a significant effect on the average firm, its effect is greatest for firms that are more aggressive in avoiding tax, for countries with lax enforcement prior to the enactment of the GAAR, and in countries where the taxpayer bears some portion of the burden of proof. Documenting these effects are important as it provides evidence on an important and increasingly prevalent tax enforcement tool available to the tax authority. In addition, these results are helpful to policymakers in evaluating the effectiveness of a GAAR for their regime. Finally, our study provides direct evidence on a specific tax enforcement mechanism, shedding light into the tax enforcement black box.

# References

Armstrong, C.S., Blouin, J.L., Larcker, D.F., 2012. The incentives for tax planning. Journal of Accounting and Economics 53, 391–411.

Atwood, T., Drake, M.S., Myers, J.N., Myers, L.A., 2012. Home country tax system characteristics and corporate tax avoidance: International evidence. The Accounting Review 87, 1831–1860.

Atwood, T., Drake, M.S., Myers, L.A., 2010. Book-tax conformity, earnings persistence and the association between earnings and future cash flows. Journal of Accounting and Economics 50, 111–125.

Bloomberg Law, 2009. Mexico's journey to substance over form. URL: https://www.bna.com/mexicos-journey-substance-n2147483696/.

Central Intelligence Agency, 2018. The World Factbook. URL: https://www.cia.gov/library/publications/the-world-factbook/.

Deloitte, 2017. General anti-avoidance rules (GAAR): India and international experience.

Desai, M.A., Dyck, A., Zingales, L., 2007. Theft and taxes. Journal of Financial Economics 84, 591–623.

DeSimone, L., Stomberg, B., Williams, B., 2019. How tax enforcement disparately affects domestic corporations around the world. Working paper.

Djankov, S., La Porta, R., de Silanes, F.L., Shleifer, A., 2008. The law and economics of self-dealing. Journal of Financial Economics 88, 430–465.

Dyck, A., Zingales, L., 2004. Private benefits of control: An international comparison. The Journal of Finance 59, 537–600.

Dyreng, S.D., Hanlon, M., Maydew, E.L., 2008. Long-run corporate tax avoidance. The Accounting Review 83, 61–82.

El Ghoul, S., Guedhami, O., Pittman, J., 2011. The role of IRS monitoring in equity pricing in public firms. Contemporary Accounting Research 28, 643–674.

Ernst&Young, 2013. GAAR rising: Mapping tax enforcement's evolution.

Ernst&Young, 2017. Worldwide corporate tax guide.

Frank, M.M., Lynch, L.J., Rego, S.O., 2009. Tax reporting aggressiveness and its relation to aggressive financial reporting. The Accounting Review 84, 467–496.

Gupta, S., Newberry, K., 1997. Determinants of the variability in corporate effective tax rates: Evidence from longitudinal data. Journal of Accounting and Public Policy 16, 1–34.

Hanlon, M., Heitzman, S., 2010. A review of tax research. Journal of Accounting and Economics 50, 127–178.

Hanlon, M., Hoopes, J.L., Shroff, N., 2014. The effect of tax authority monitoring and enforcement on financial reporting quality. The Journal of the American Taxation Association 36, 137–170.

Hanlon, M., Slemrod, J., 2009. What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement. Journal of Public Economics 93, 126–141.

Hoopes, J.L., Mescall, D., Pittman, J.A., 2012. Do IRS audits deter corporate tax avoidance? The Accounting Review 87, 1603–1639.

International Law Office, 2011. Anti-avoidance rules for reorganisation transactions. URL: https://www.internationallawoffice.com.

Johansson, A., Skeie, O.B., Sorbe, S., 2016. Anti-avoidance rules against international tax planning: A classification. OECD Working paper.

Johansson, A., Skeie, O.B., Sorbe, S., Menon, C., 2017. Tax planning by multinational firms: Firm-level evidence from a cross-country database. OECD Working paper.

Kerr, J.N., 2019a. Transparency, information shocks, and tax avoidance. Contemporary Accounting Research 36, 1146–1183.

Kerr, J.N., 2019b. The value relevance of taxes: International evidence on the proxy for profitability role of tax surprise. Journal of Accounting and Economics 67, 297–305.

La Porta, R., de Silanes, F.L., Shleifer, A., 1998. Law and finance. Journal of Political Economy 106, 1113–1155.

Mills, L.F., Nutter, S.E., Schwab, C.M., 2013. The effect of political sensitivity and bargaining power on taxes: Evidence from federal contractors. The Accounting Review 88, 977–1005.

Nagato, T., 2017. A general anti-avoidance rule (gaar) and the rule of law in japan. Public Policy Review 13, 35–70.

PricewaterhouseCoopers LLP, 2004. Tax risk management.

Rego, S.O., 2003. Tax-avoidance activities of U.S. multinational corporations. Contemporary Accounting Research 20, 805–833.

Scholes, M.S., Wolfson, M.A., Erickson, M., Maydew, E.L., Shevlin, T., 2009. Taxes and business strategy: A planning approach, Fourth Edition. Pearson Prentice Hall.

Slemrod, J., Blumenthal, M., Christian, C., 2001. Taxpayer response to an increased probability of audit: Evidence from a controlled experiment in Miinnesota. Journal of Public Economics 79, 455–483.

Sloan, R.G., 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? The Accounting Review 71, 289–315.

Wilson, R., 2009. An examination of corporate tax shelter participants. The Accounting Review 83, 519–548.

# Appendix A: Variable Definitions

| Variable | Description and Data Source |
|---|---|
| ***Dependent Variables*** | |
| CorpTaxRev | Country-year measure of total corporate income, profits, and capital gains taxes, scaled by GDP. |
| TaxAvoid | The ratio of total tax expense (TXT) to pre-tax income (PI), multiplied by negative one. |
| TaxAvoid Ratio | The ratio of the effective tax rate to the country statutory tax rate (CSTR), multiplied by negative one, where effective tax rate is measured as the ratio of total tax expense (TXT) to pre-tax income (PI). |
| TaxAvoid Spread | CSTR less the ratio of total tax expense (TXT) to pre-tax income (PI). |
| TaxAvoid Vol | Five-year rolling standard deviation of tax avoidance, computed over the years t to t+4, where tax avoidance is computed as TaxAvoid, TaxAvoid Ratio, or TaxAvoid Spread. |
| ***Cross-Sectional Variables*** | |
| Burden-Shared | An indicator variable set equal to 1 for observations in countries where the burden of proof is shared by the taxpayer and the tax authority. |
| Burden-Taxpayer | An indicator variable set equal to 1 for observations in countries where the burden of proof falls on the taxpayer. |
| Burden-Taxpayer or Shared | An indicator variable set equal to 1 for observations in countries where the burden of proof either falls on the taxpayer or is shared by the taxpayer and the tax authority. |
| GAAR | Indicator variable set equal to 1 for firms years ending after the GAAR effective date, as outlined in Appendix B. |
| HI Avoider | Indicator variable set equal to 1 for firms with 3-year long run tax avoidance in year t-1 exceeding the median long-run tax avoidance of all other firms in that particular country, where t is the year of the GAAR effective date. Tax avoidance is computed as TaxAvoid, TaxAvoid Ratio, and TaxAvoid Spread, as defined above. |
| LO Enforce | Indicator variable set equal to 1 for countries with tax enforcement in year t-1 that falls below the median enforcement of all countries in the sample in that year, where t is the year of the GAAR effective date. Yearly tax enforcement is measured using the tax evasion index obtained from the IMD World Competitiveness Report website. The tax evasion index measures manager's perception of the strength of the tax enforcement in that country. |
| ***Control Variables*** | |
| Age | Log of 1 + firm Age, where Age is computed as the current firm year less the first year the firm's GVKEY or ISIN appears in Compustat. |
| AggLoss | Indicator set equal to 1 if the sum of pre-tax income (PI) for the current and prior year is less than zero. |
| AntiDirRights | Country-level index variable for anti-director rights as reported in La Porta et al. (1998). Higher scores correspond to less director-related rights. |
| ASD Index | Country-level index variable based on the anti-self dealing index (Djankov et al. 2008), which measures the strength of minority shareholder protection against self-dealing by the controlling shareholder. Higher values correspond to greater protection. |
| BM | Ratio of book value of equity (CEQ) to market value of equity (PRCCD * shares outstanding). |
| BookTaxConf | Country-level variable for conformity between book and tax income as reported in Atwood et al. (2012). Higher scores correspond to greater conformity between book and tax. |
| CF Constraint | 1 minus the ratio of operating cash flows (OANCF) to beginning of year assets ($AT_{t-1}$). If OANCF is missing, this variable is set equal to zero. |
| Civil Law | Indicator variable set equal to 1 for country-years with civil law systems. |
| CSTR | Firm-year weighted average of the statutory corporate income tax rates in effect for a given country. |
| EarnVol | Decile ranking of ROA volatility, measured at the country-year level, where higher values represent higher earnings volatility. |

# Appendix A: Variable Definitions

| Variable | Description and Data Source |
|---|---|
| Intangibles | Total intangibles (INTAN), scaled by beginning of year assets ($AT_{t-1}$).   If INTAN is missing, this value is set equal to zero. |
| Leverage | Sum of long term debt (DLTT) and current debt (DLC), scaled by beginning of year assets ($AT_{t-1}$). |
| OwnCon | Country-level index variable representing the concentration of ownership as reported in La Porta et al. (1998).  Measured as the average percentage of common shares owned by the three largest shareholders in the ten largest non financial, privately-owned domestic firms in a given country. Higher scores correspond to more concentrated ownership. |
| PBOpp_C | Country-level variable for the opportunities of private benefits extraction based upon the Anti-Self Dealing Index as reported in Djankov et al. (2008). Set equal to one when a country has an index score in the bottom quartile of all countries, and zero otherwise. |
| PP&E | Total property, plant, and equipment, net of depreciation (PPENT), scaled by beginning of year assets ($AT_{t-1}$). |
| R&D | Total R&D expense (XRD), scaled by beginning of year assets ($AT_{t-1}$). If XRD is missing, this value is set equal to zero. |
| ROA | Pre-tax income (PI), scaled by beginning of year assets ($AT_{t-1}$). |
| Size | Log of firm size, where size is equal to total assets ($AT_t$) converted to a common currency (USD). |
| Worldwide | Country-level indicator variable for the presence of a worldwide taxation system as reported in Atwood et al. (2012). |

**Appendix B: GAAR effective dates**

| Country | ISO Code | In Country-Level Sample? | In Firm-Level Sample? | GAAR Effective Date | GAAR Type | E&Y[a] | Johansson et al. (2016)[b] | Other Source | Ref | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| Australia | AUS | YES | YES | 1/1/2016 | GAAR | 5/27/1981 | 1981 | | c | 2 |
| Belgium | BEL | YES | YES | 4/6/2012 | GAAR | 4/6/2012 | 2012 | | a | 2 |
| Brazil | BRA | YES | YES | 1/1/2001 | GAAR | 2001 | 2001 | 1/1/2001 | a, c | |
| Canada | CAN | YES | NO | 9/12/1988 | GAAR | 9/12/1988 | 1988 | | a | |
| China | CHN | NO | YES | 1/1/2008 | GAAR | 1/1/2008 | 2008 | | a | |
| Czech Republic | CZE | NO | YES | 1/1/2005 | GAAR-LIKE | - | 2005 | | b | 1 |
| Estonia | EST | NO | YES | 1/1/2002 | GAAR | - | 2002 | | b | 1 |
| France | FRA | YES | NO | 1/1/1941 | GAAR | 1941 | 1981 | | a | 1 |
| Germany | DEU | YES | YES | 1/1/2008 | GAAR | 1/1/2008 | 2008 | | a | 2 |
| Greece | GRC | NO | YES | 1/1/2014 | GAAR | - | 2014 | | b | 1 |
| Iceland | ISL | NO | NO | 1/1/1971 | GAAR | - | 1971 | | b | 1 |
| India | IND | NO | NO | 4/1/2017 | GAAR-LIKE | 4/1/2016 | - | 4/1/2017 | f | |
| Indonesia | IDN | NO | YES | 1/1/2009 | GAAR-LIKE | 1/1/2009 | - | | a | 3 |
| Ireland | IRL | NO | YES | 10/23/2014 | GAAR | 1/25/1989 | 1989 | | a, f | 2 |
| Italy | ITA | YES | NO | 1/1/1997 | GAAR | 1997 | 1997 | | a | 1 |
| Japan | JPN | YES | YES | 1/1/2001 | GAAR-LIKE | - | - | 1/1/2001 | a, d, g | 1,2,4 |
| Luxembourg | LUX | NO | NO | 1/1/1948 | GAAR | - | 1948 | | b | 1 |
| Malaysia | MYS | YES | NO | 1/1/1967 | GAAR | - | 1967 | | b | 1 |
| Mexico | MEX | YES | YES | 1/1/2008 | GAAR-LIKE | - | - | 1/1/2008 | a, e | 5 |
| New Zealand | NZL | NO | NO | 1/1/1974 | GAAR | - | 1974 | | b | 1 |
| Poland | POL | NO | YES | 7/15/2016 | GAAR-LIKE | - | - | 7/15/2016 | f | 6 |
| Russia | RUS | NO | YES | 10/12/2006 | GAAR-LIKE | 10/12/2006 | 2006 | | a | |
| Singapore | SGP | YES | NO | 1/29/1988 | GAAR | 1/29/1988 | 1988 | | a | |
| South Africa | ZAF | YES | YES | 11/2/2006 | GAAR | 11/2/2006 | 2006 | | a | |
| South Korea | KOR | YES | NO | 1/1/1990 | GAAR-LIKE | 1/1/1990 | 1990 | | a | |
| Spain | ESP | YES | YES | 1/1/2003 | GAAR | - | 2003 | | b | 1,2 |
| Sweden | SWE | YES | NO | 1/1/1995 | GAAR | 1995 | 1995 | | a | 1 |
| Switzerland | CHE | YES | NO | 12/14/1962 | GAAR | 12/14/1962 | 1962 | | a | |
| The Netherlands | NLD | YES | NO | 1/1/1924 | GAAR | 1924 | 1987 | | a | 1 |
| Turkey | TUR | NO | NO | 12/30/1980 | GAAR | 12/30/1980 | 1980 | | a | |
| United Kingdom | GBR | YES | YES | 7/17/2013 | GAAR | - | - | 7/17/2013 | f | 7 |

**Appendix B: GAAR effective dates**

References:

a  E&Y, "GAAR rising – Mapping tax enforcement's evolution."  February 2013.

b  Johansson Å., Skeie Ø. and S. Sorbe (2016), "Anti-avoidance rules against international tax planning: a classification," OECD Economics Department Working Papers No. 1356, OECD Publishing.

c  Deloitte, "General Anti-Avoidance Rules (GAAR) India and International Experience."  March 2017.

d  International Law Office, "Anti-avoidance rules for reorganisation transactions."  https://www.internationallawoffice.com.

e  Bloomberg Law, "Mexico's Journey to Substance over Form."  March 2, 2009.

f  E&Y, "Worldwide Corporate Tax Guide."  2017.

g  Nagato (2017), "A General AntiAvoidance Rule (GAAR) and the Rule of Law in Japan", 13 PUB. POL'Y REV. 35, 58-63 (2017).

Notes:

1  In cases where only the year of GAAR enactment was identified (as opposed to the specific day within the enactment year), January 1 of the GAAR enactment year was used as the effective date.

2  The effective dates listed for Australia, Belgium, Germany, Ireland, Japan, and Spain represent dates of major legislative changes to pre-existing GAAR regimes.  Each of these countries had initial GAARs or GAAR-like regimes enacted prior to the sample period start.

3  Johansson et al. (2016) does not note a GAAR or economic substance rule for Indonesia.  However, the Indonesian tax law regulations established the principle of substance over form, which we classify as GAAR-like, in 2009.

4  E&Y (2013) shows Japan as having a GAAR-like regime; Johansson et al. (2016) does not show an economic substance rule or GAAR for Japan.  Per E&Y (2013), Japanese corporate tax law provides a general tax avoidance rule for closely held corporations (CTA 132, enacted in 1932) and a general tax avoidance rule for transactions within a consolidated group (CTA 132-3, enacted in 2002). Additionally, Japan has a quasi-GAAR that targets unforeseen tax benefits of carryover tax attributes in corporate reorganizations (CTA 132-2, enacted in 2001) (Nagato 2017).  These rules enable the Japanese National Tax Agency (NTA) the power to recalculate the taxpayer's taxable income or corporate tax due if the NTA determines a transaction results in an unreasonable reduction of corporate tax due.  Following the methodology discussed in Section 3, we classify the 2001 regulation as a legislative strengthening of Japan's GAAR-like regime.  We note that our results are robust to instead using the 2002 enactment of CTA 132-3 as the legislative strengthening date.

5  E&Y (2013) shows Mexico as having a GAAR-like regime; Johansson et al. (2016) does not show an economic substance rule or GAAR for Mexico.  Per Bloomberg Law (2009), Article 213 of the MITL was effective in 2008 and allowed tax authorities to recharacterize tax treatment of transactions.  We classify this law as GAAR-like.

6  E&Y (2013) shows Poland as having a GAAR-like regime;  Johansson et al. (2016) does not show an economic substance rule or GAAR for Poland. Poland had a GAAR enacted beginning in 2003 until it was overturned in May 11, 2004.  The GAAR was reintroduced in 2016.

7  Johansson et al. (2016) and E&Y 2013 show the UK as having no GAAR, likely due to these studies ending prior to the UK GAAR enactment.

**Appendix C: Effective dates of other anti-avoidance policies**

| Country | ISO Code | In Country-Level Sample? | In Firm-Level Sample? | CFC Rules[a] | Transfer Pricing Rules[a] | Debt Rules[a] |
|---|---|---|---|---|---|---|
| Australia | AUS | YES | YES | 1990 | 1981 | 1987 |
| Belgium | BEL | YES | YES | - | 1994 | - |
| Brazil | BRA | YES | YES | 2001 | 1997 | 2010 |
| Canada | CAN | YES | NO | 1976 | 1998 | 1972 |
| China | CHN | NO | YES | 2008 | 1991 | 2008 |
| Czech Republic | CZE | NO | YES | - | 1993 | 1993 |
| Estonia | EST | NO | YES | 2000 | 2007 | - |
| France | FRA | YES | NO | 1980 | 1996 | 1979 |
| Germany | DEU | YES | YES | 1972 | 1983 | 1994 |
| Greece | GRC | NO | YES | 2014 | 1994 | n/a |
| Iceland | ISL | NO | NO | 2009 | . | - |
| India | IND | NO | NO | - | 2004 | - |
| Indonesia | IDN | NO | YES | 1995 | 1984 | - |
| Ireland | IRL | NO | YES | - | . | - |
| Italy | ITA | YES | NO | 2000 | 1988 | - |
| Japan | JPN | YES | YES | 1978 | 1986 | 1992 |
| Luxembourg | LUX | NO | NO | - | 2005 | n/a |
| Malaysia | MYS | NO | NO | - | 2003 | - |
| Mexico | MEX | YES | YES | 1997 | 1996 | 2005 |
| New Zealand | NZL | NO | NO | 1988 | 1997 | n/a |
| Poland | POL | NO | YES | - | 1992 | 1999 |
| Russia | RUS | NO | YES | - | 1999 | 2002 |
| Singapore | SGP | YES | NO | - | 2006 | - |
| South Africa | ZAF | YES | YES | 1997 | 1995 | 2005 |
| South Korea | KOR | YES | NO | 1996 | 1996 | 2000 |
| Spain | ESP | YES | YES | 1994 | 1997 | 1992 |
| Sweden | SWE | YES | NO | 1990 | 2007 | - |
| Switzerland | CHE | YES | NO | - | . | 1962 |
| The Netherlands | NLD | YES | NO | - | 2002 | 2004 |
| Turkey | TUR | NO | NO | 2006 | 2007 | - |
| United Kingdom | GBR | YES | YES | 1984 | 1999 | 1988 |

Reference:

a Johansson Å., Skeie Ø. and S. Sorbe (2016), "Anti-avoidance rules against international tax planning: a classification", OECD Economics Department Working Papers No. 1356, OECD Publishing.

**Table 1**
**Panel A:  Country-level sample composition with descriptive statistics**

| Country | ISO Code | N | GAAR Effective Date | CorpTaxRev | CSTR | Worldwide | EarnVol | Rule of Law | AntiDirRights | BookTaxConf | OwnCon | ASD Index | PBOpp_C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AUSTRALIA | AUS | 20 | 1/1/2016 | 5.081 | 0.308 | 1 | 8.700 | Common | 4 | 0.125 | 0.280 | 0.757 | 0 |
| BELGIUM | BEL | 20 | 4/6/2012 | 3.126 | 0.356 | 0 | 5.000 | Civil | 0 | 0.219 | 0.540 | 0.544 | 0 |
| BRAZIL | BRA | 20 | 1/1/2002 | 2.942 | 0.341 | 1 | 5.050 | Civil | 3 | 0.406 | 0.570 | 0.274 | 1 |
| CANADA | CAN | 20 | 9/12/1988 | 3.443 | 0.329 | 0 | 9.000 | Common | 5 | 0.031 | 0.400 | 0.642 | 0 |
| FRANCE | FRA | 20 | 1/1/1941 | 2.551 | 0.367 | 0 | 5.050 | Civil | 3 | 0.783 | 0.340 | 0.379 | 0 |
| GERMANY | DEU | 20 | 1/1/2008 | 1.691 | 0.363 | 0 | 6.350 | Civil | 1 | 0.118 | 0.480 | 0.282 | 1 |
| ITALY | ITA | 20 | 1/1/1997 | 2.593 | 0.351 | 1 | 2.950 | Civil | 1 | 0.563 | 0.580 | 0.421 | 0 |
| JAPAN | JPN | 20 | 1/1/2001 | 3.593 | 0.386 | 1 | 2.100 | Civil | 4 | 0.706 | 0.180 | 0.499 | 0 |
| MALAYSIA | MYS | 20 | 1/1/1967 | 7.454 | 0.264 | 0 | 5.950 | Common | 4 | 0.719 | 0.540 | 0.950 | 0 |
| MEXICO | MEX | 16 | 1/1/2008 | 2.101 | 0.303 | 1 | 2.688 | Civil | 1 | 0.406 | 0.640 | 0.172 | 1 |
| NETHERLANDS | NLD | 20 | 1/1/1924 | 3.075 | 0.291 | 0 | 4.250 | Civil | 2 | 0.652 | 0.390 | 0.203 | 1 |
| SINGAPORE | SGP | 18 | 1/29/1988 | 3.960 | 0.196 | 0 | 5.833 | Common | 4 | 0.750 | 0.490 | 1.000 | 0 |
| SOUTH AFRICA | ZAF | 20 | 11/2/2006 | 4.686 | 0.350 | 1 | 7.200 | Common | 5 | 0.094 | 0.520 | 0.813 | 0 |
| SOUTH KOREA | KOR | 20 | 1/1/1990 | 3.250 | 0.269 | 1 | 4.350 | Civil | 2 | 0.594 | 0.230 | 0.469 | 0 |
| SPAIN | ESP | 20 | 1/1/2003 | 2.782 | 0.318 | 0 | 3.300 | Civil | 4 | 0.906 | 0.510 | 0.374 | 0 |
| SWEDEN | SWE | 20 | 1/1/1995 | 2.894 | 0.262 | 0 | 6.500 | Civil | 3 | 0.424 | 0.280 | 0.333 | 0 |
| SWITZERLAND | CHE | 20 | 1/1/1962 | 2.625 | 0.225 | 0 | 2.600 | Civil | 2 | 0.875 | 0.410 | 0.267 | 1 |
| UNITED KINGDOM | GBR | 20 | 7/17/2013 | 2.917 | 0.269 | 1 | 7.550 | Common | 5 | 0.469 | 0.190 | 0.950 | 0 |
|  |  | 354 |  |  |  |  |  |  |  |  |  |  |  |

This table presents sample composition for the country-level analysis, along with a summary of pertinent descriptive statistics. Variable definitions are available in the Appendix. The descriptive statistics are based on data for the fiscal years ending January 31, 1998 to December 31, 2017 and with data sufficient to estimate the least restrictive empirical model.  The Anti-Self Dealing Index is as reported in Djankov et al. (2008) and is used to create the PBOpp_C variable.

**Table 1**

**Panel B:  Country-level analysis of the effect of the presence of a GAAR on corporate tax revenue collections**

| | (1) CorpTaxRev | | (2) CorpTaxRev | |
|---|---|---|---|---|
| | Coefficient | Std Error | Coefficient | Std Error |
| *Predicted Sign on GAAR* | + | | + | |
| **GAAR** | 0.657*** | [0.140] | 0.651*** | [0.116] |
| CSTR | 4.034*** | [1.138] | 4.330*** | [1.041] |
| Worldwide | 0.224** | [0.103] | 0.230 | [0.155] |
| EarnVol | 0.002 | [0.025] | 0.002 | [0.017] |
| Civil Law | -2.679*** | [0.297] | | |
| AntiDirRights | -0.204*** | [0.057] | | |
| BookTaxConf | 1.503*** | [0.345] | | |
| OwnCon | 0.430 | [0.445] | | |
| PBOpp_C | -0.350*** | [0.107] | | |
| Fixed Effects | Year | | Year & Country | |
| Observations | 354 | | 354 | |
| R-Squared | 0.510 | | 0.870 | |

This table presents OLS regression estimations of country-level corporate tax revenues.  The dependent variable in all specifications is CorpTaxRev, which is the country-year measure of corporate income tax collected as a percentage of GDP.  The primary independent variable of interest is *GAAR,* an indicator set equal to 1 for firm years ending after the GAAR effective date.  All variables are as defined in the Appendix.  Robust standard errors are reported in brackets next to the coefficients.  Year and country fixed effects are included where indicated, though coefficients are suppressed.  Significance levels are based upon two-sided t-tests and are indicated as follows: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

**Table 1**
**Panel C: Country-level analysis of the effect of the presence of a GAAR on median tax avoidance**

| | (1) Median TaxAvoid | | (2) Median TaxAvoid | | (3) Median TaxAvoid Spread | | (4) Median TaxAvoid Spread | | (5) Median TaxAvoid Ratio | | (6) Median TaxAvoid Ratio | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error |
| *Predicted Sign on GAAR* | - | | - | | - | | - | | - | | - | |
| **GAAR** | -0.032*** | [0.007] | -0.021*** | [0.006] | -0.035*** | [0.007] | -0.025*** | [0.007] | -0.088*** | [0.019] | -0.058*** | [0.018] |
| CSTR | -0.847*** | [0.059] | -0.500*** | [0.075] | | | | | | | | |
| Worldwide | -0.031*** | [0.006] | -0.038*** | [0.007] | -0.029*** | [0.005] | -0.034*** | [0.007] | -0.079*** | [0.016] | -0.078*** | [0.017] |
| EarnVol | 0.003** | [0.001] | 0.000 | [0.001] | 0.003** | [0.001] | 0.001* | [0.001] | 0.007** | [0.003] | 0.004* | [0.002] |
| Civil Law | 0.023** | [0.009] | | | 0.040*** | [0.007] | | | 0.089*** | [0.023] | | |
| AntiDirRights | 0.008*** | [0.003] | | | 0.010*** | [0.003] | | | 0.028*** | [0.008] | | |
| BookTaxConf | -0.030** | [0.012] | | | -0.048*** | [0.010] | | | -0.105*** | [0.031] | | |
| OwnCon | 0.141*** | [0.019] | | | 0.159*** | [0.018] | | | 0.422*** | [0.052] | | |
| PBOpp_C | 0.001 | [0.006] | | | -0.005 | [0.006] | | | -0.004 | [0.018] | | |
| Fixed Effects | Year | | Year & Country | | Year | | Year & Country | | Year | | Year & Country | |
| Observations | 354 | | 354 | | 354 | | 354 | | 354 | | 354 | |
| R-Squared | 0.660 | | 0.865 | | 0.399 | | 0.710 | | 0.339 | | 0.694 | |

This table presents OLS regression estimations of country-level tax avoidance. The dependent variables are three measures of country-year median tax avoidance. TaxAvoid is the ratio of total tax expense to pre-tax income, multiplied by negative one. TaxAvoid Ratio is the ratio of TaxAvoid to the country statutory tax rate (CSTR). TaxAvoid Spread is computed as CSTR minus the ratio of total tax expense to pre-tax income. GAAR is an indicator set equal to 1 for firm years ending after the GAAR effective date. All variables are as defined in the Appendix. Robust standard errors are reported in brackets next to the coefficients. Year and country fixed effects are included where indicated, though coefficients are suppressed. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

**Table 2: Firm-level sample selection**

| | |
|---|---:|
| **Compustat Global observations for the fiscal years ending January 1, 1998 to December 31, 2017** | **224,874** |
| *Australia, Belgium, Brazil, China, Czech Republic, Estonia, Germany, Greece, Indonesia, Ireland, Japan, Poland, Russia, South Africa, Spain, and United Kingdom.* | |
| **Compustat North America observations for the fiscal years ending January 1, 1998 to December 31, 2017** | **2,524** |
| *Mexico* | |
| **Total Observations obtained from Compustat** | **227,398** |
| Less: observations with missing or non-positive PI | (61,192) |
| Less: observations with missing or non-positive current or one-year lagged AT | (17,501) |
| Less: observations with missing TXT | (1,774) |
| Less: observations with missing PP&E | (6,512) |
| Less: observations with missing Leverage | (5,101) |
| Less: observations with other missing control variables | (1,535) |
| **Total Observations for TaxAvoid Ratio, TaxAvoid, and TaxAvoid Spread Samples** | **133,783** |

**Table 3**
**Panel A:  Firm-level descriptive statistics**

| Variable | Observations | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| GAAR | 133,783 | 0.655 | 0.475 | 0.000 | 1.000 |
| CSTR | 133,783 | 0.326 | 0.068 | 0.125 | 0.564 |
| Age | 133,783 | 2.527 | 0.546 | 1.099 | 3.401 |
| ROA | 133,783 | 0.083 | 0.086 | 0.002 | 0.506 |
| Leverage | 133,783 | 0.225 | 0.212 | 0.000 | 0.997 |
| Size | 133,783 | 5.919 | 1.900 | 1.625 | 11.497 |
| BM | 133,783 | 1.015 | 1.092 | 0.001 | 7.597 |
| AggLoss | 133,783 | 0.068 | 0.252 | 0.000 | 1.000 |
| CF Constraint | 133,783 | 0.927 | 0.091 | 0.582 | 1.178 |
| Intangibles | 133,783 | 0.080 | 0.162 | 0.000 | 0.855 |
| PP&E | 133,783 | 0.313 | 0.244 | 0.000 | 1.076 |
| R&D | 133,783 | 0.009 | 0.022 | 0.000 | 0.131 |
| TaxAvoid | 133,783 | -0.308 | 0.293 | -1.909 | 0.682 |
| TaxAvoid Spread | 133,783 | 0.018 | 0.281 | -1.570 | 1.001 |
| TaxAvoid Ratio | 133,783 | -0.932 | 0.878 | -5.781 | 2.265 |

This table presents a summary of firm-level descriptive statistics. Variable definitions are available in the Appendix.  The descriptive statistics are based on data for the fiscal years ending January 31, 1998 to December 31, 2017 and with data sufficient to estimate the least restrictive empirical model.

Table 3
Panel B: Firm-level sample composition by country with descriptive statistics

| Country | | N | TaxAvoid | TaxAvoid Ratio | TaxAvoid Spread | GAAR Effective Date | CSTR | IMD Tax Evasion Index | Burden of Proof | Age | ROA | Leverage | Size | BM | AggLoss | CF Constraint | Intangibles | PP&E | R&D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AUSTRALIA | AUS | 8,189 | -0.219 | -0.715 | 0.087 | 1/1/2016 | 0.306 | 5.827 | T | 2.295 | 0.134 | 0.223 | 5.138 | 0.846 | 0.116 | 0.901 | 0.197 | 0.302 | 0.007 |
| BELGIUM | BEL | 1,397 | -0.219 | -0.618 | 0.134 | 4/6/2012 | 0.354 | 3.545 | TA | 2.416 | 0.092 | 0.240 | 6.260 | 1.180 | 0.060 | 0.919 | 0.135 | 0.273 | 0.013 |
| BRAZIL | BRA | 2,907 | -0.242 | -0.709 | 0.098 | 1/1/2002 | 0.340 | 3.067 | T | 2.411 | 0.098 | 0.304 | 6.982 | 1.296 | 0.073 | 0.923 | 0.104 | 0.317 | 0.002 |
| CHINA | CHN | 26,646 | -0.197 | -0.731 | 0.074 | 1/1/2008 | 0.270 | 3.659 | T | 2.412 | 0.073 | 0.239 | 6.216 | 0.650 | 0.058 | 0.940 | 0.062 | 0.367 | 0.007 |
| CZECH REPUBLIC | CZE | 232 | -0.222 | -0.863 | 0.044 | 1/1/2005 | 0.265 | 3.992 | | 2.014 | 0.080 | 0.148 | 6.561 | 1.897 | 0.034 | 0.898 | 0.028 | 0.522 | 0.001 |
| ESTONIA | EST | 155 | -0.126 | -0.586 | 0.098 | 1/1/2001 | 0.224 | 4.782 | | 2.256 | 0.141 | 0.206 | 4.711 | 3.093 | 0.026 | 0.856 | 0.076 | 0.433 | 0.002 |
| GERMANY | DEU | 7,467 | -0.301 | -0.859 | 0.054 | 1/1/2008 | 0.355 | 5.095 | S | 2.443 | 0.089 | 0.210 | 5.852 | 0.885 | 0.078 | 0.921 | 0.139 | 0.231 | 0.018 |
| GREECE | GRC | 1,965 | -0.367 | -1.265 | -0.068 | 1/1/2014 | 0.296 | 2.283 | | 2.019 | 0.074 | 0.300 | 5.472 | 1.420 | 0.060 | 0.953 | 0.056 | 0.365 | 0.003 |
| INDONESIA | IDN | 3,968 | -0.272 | -1.000 | 0.001 | 1/1/2009 | 0.272 | 3.525 | S | 2.316 | 0.107 | 0.293 | 5.257 | 1.013 | 0.071 | 0.920 | 0.022 | 0.378 | 0.000 |
| IRELAND | IRL | 624 | -0.174 | -1.175 | -0.019 | 10/23/2014 | 0.151 | 5.826 | T | 2.538 | 0.089 | 0.238 | 6.597 | 0.756 | 0.066 | 0.905 | 0.184 | 0.306 | 0.009 |
| JAPAN | JPN | 52,285 | -0.424 | -1.105 | -0.039 | 1/1/2001 | 0.386 | 5.964 | TA | 2.789 | 0.064 | 0.213 | 5.934 | 1.207 | 0.068 | 0.938 | 0.024 | 0.302 | 0.012 |
| MEXICO | MEX | 1,741 | -0.283 | -0.914 | 0.027 | 1/1/2008 | 0.310 | 2.394 | TA | 2.448 | 0.095 | 0.267 | 9.355 | 1.063 | 0.028 | 0.906 | 0.129 | 0.414 | 0.000 |
| POLAND | POL | 3,948 | -0.202 | -1.002 | -0.001 | 7/15/2016 | 0.198 | 3.867 | S | 2.140 | 0.093 | 0.203 | 4.385 | 1.035 | 0.079 | 0.925 | 0.101 | 0.312 | 0.002 |
| RUSSIA | RUS | 1,142 | -0.283 | -1.357 | -0.077 | 10/12/2006 | 0.205 | 3.022 | T | 2.270 | 0.104 | 0.270 | 6.960 | 2.409 | 0.062 | 0.909 | 0.037 | 0.462 | 0.001 |
| SOUTH AFRICA | ZAF | 3,718 | -0.273 | -0.794 | 0.078 | 11/2/2006 | 0.351 | 4.521 | S | 2.266 | 0.144 | 0.184 | 5.679 | 0.942 | 0.045 | 0.895 | 0.106 | 0.282 | 0.002 |
| SPAIN | ESP | 1,756 | -0.214 | -0.674 | 0.106 | 1/1/2003 | 0.320 | 4.150 | | 2.475 | 0.078 | 0.297 | 7.291 | 1.538 | 0.044 | 0.949 | 0.124 | 0.337 | 0.002 |
| UNITED KINGDOM | GBR | 15,643 | -0.243 | -0.869 | 0.036 | 7/17/2013 | 0.278 | 5.569 | TA | 2.359 | 0.104 | 0.205 | 5.611 | 0.851 | 0.070 | 0.897 | 0.194 | 0.258 | 0.012 |
| | | 133,783 | | | | | | | | | | | | | | | | | |

This table presents sample composition by country along with a summary of pertinent descriptive statistics. Variable definitions are available in the Appendix. Where relevant, mean values of firm-year variables are reported. The descriptive statistics are based on data for the fiscal years ending January 31, 1998 to December 31, 2017 and with data sufficient to estimate the least restrictive empirical model.

**Table 4: Correlation matrix**

| Variable | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GAAR | (1) | | **0.0214** | **0.4328** | **-0.0967** | **-0.0307** | **0.1559** | **0.0416** | **-0.0293** | **0.0341** | -0.0054 | -0.0018 | **0.2498** | **-0.1246** | **-0.1166** | **-0.1041** |
| CSTR | (2) | **0.0398** | | **0.0869** | **-0.1143** | **0.0119** | -0.0076 | **0.3112** | **0.0238** | **0.0736** | **-0.1860** | **0.0316** | **0.1492** | **-0.4855** | **-0.1763** | **-0.1855** |
| Age | (3) | **0.4250** | **0.0995** | | **-0.1668** | -0.0020 | **0.3097** | **0.1759** | -0.0138 | 0.0077 | -0.0003 | **0.0393** | **0.2520** | **-0.1347** | **-0.1080** | **-0.1120** |
| ROA | (4) | **-0.1210** | **-0.1027** | **-0.1832** | | **-0.2319** | **-0.0997** | **-0.3589** | **-0.2297** | **-0.4416** | **0.1388** | **-0.0323** | 0.0012 | **0.1395** | **0.1296** | **0.1304** |
| Leverage | (5) | **-0.0332** | -0.0018 | **-0.0351** | **-0.1232** | | **0.2248** | **-0.0347** | **0.0614** | **0.1030** | **0.0641** | **0.3137** | **-0.1245** | 0.0014 | -0.0049 | -0.0115 |
| Size | (6) | **0.1472** | 0.0052 | **0.2944** | **-0.1494** | **0.1868** | | -0.0181 | **-0.1207** | 0.0027 | **0.0977** | **0.1215** | **0.1008** | **-0.0318** | -0.0174 | -0.0205 |
| BM | (7) | 0.0063 | **0.1446** | **0.0468** | **-0.2225** | **-0.0454** | -0.0081 | | 0.0209 | **0.2045** | **-0.2129** | **0.0355** | 0.0160 | **-0.2219** | **-0.1493** | **-0.1536** |
| AggLoss | (8) | -0.0293 | 0.0154 | -0.0096 | **-0.1330** | **0.0661** | **-0.1231** | 0.0408 | | **0.0979** | **-0.0328** | -0.0114 | -0.0079 | **0.0726** | **0.0758** | **0.0739** |
| CF Constraint | (9) | **0.0733** | **0.0735** | **0.0450** | **-0.4727** | **0.0998** | 0.0258 | **0.1543** | **0.0913** | | **-0.2086** | **-0.2183** | **-0.0929** | -0.0171 | -0.0045 | 0.0000 |
| Intangibles | (10) | **-0.1496** | **-0.2239** | **-0.1091** | **0.1500** | **0.1009** | 0.0046 | **-0.1150** | -0.0060 | **-0.1625** | | **-0.1085** | **0.1556** | **0.0327** | -0.0204 | -0.0215 |
| PP&E | (11) | **-0.0416** | -0.0138 | -0.0085 | -0.0108 | **0.3240** | **0.1083** | **0.0440** | -0.0093 | **-0.1775** | **-0.1732** | | **-0.0561** | -0.0181 | -0.0031 | -0.0036 |
| R&D | (12) | **0.0886** | **0.0487** | **0.0856** | **0.0728** | **-0.1346** | -0.0101 | **-0.0910** | 0.0086 | **-0.1062** | **0.0966** | **-0.1348** | | **-0.0885** | -0.0199 | -0.0172 |
| TaxAvoid | (13) | **-0.0799** | **-0.3005** | **-0.0829** | **0.1304** | -0.0039 | **-0.0336** | **-0.0838** | **0.0271** | **-0.0417** | **0.0709** | 0.0139 | **0.0205** | | **0.9180** | **0.9151** |
| TaxAvoid Spread | (14) | **-0.0746** | **-0.0747** | **-0.0628** | **0.1114** | -0.0048 | **-0.0343** | **-0.0527** | **0.0320** | **-0.0259** | **0.0208** | 0.0113 | **0.0334** | **0.9730** | | **0.9956** |
| TaxAvoid Ratio | (15) | **-0.0649** | **-0.0794** | **-0.0634** | **0.1087** | -0.0091 | **-0.0379** | **-0.0545** | **0.0309** | **-0.0202** | **0.0209** | 0.0102 | **0.0395** | **0.9604** | **0.9855** | |

This tables presents pairwise correlations of variables used in the primary analyses. Pearson correlation coefficients are below the diagonal while Spearman correlation coefficients are above. Correlations that are significant at the 5 percent level are in bold.

**Table 5: Analysis of the effect of the presence of a GAAR on tax avoidance**

| | (1) TaxAvoid | | (2) TaxAvoid Spread | | (3) TaxAvoid Ratio | |
|---|---|---|---|---|---|---|
| | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error |
| *Predicted Sign on GAAR* | - | | - | | - | |
| **GAAR** | -0.021*** | [0.003] | -0.032*** | [0.003] | -0.077*** | [0.010] |
| CSTR | -0.484*** | [0.044] | | | | |
| Age | 0.003 | [0.002] | 0.003 | [0.002] | 0.000 | [0.008] |
| ROA | 0.348*** | [0.013] | 0.346*** | [0.013] | 1.091*** | [0.042] |
| Leverage | 0.013** | [0.005] | 0.012** | [0.005] | 0.021 | [0.017] |
| Size | -0.004*** | [0.001] | -0.004*** | [0.001] | -0.014*** | [0.002] |
| BM | -0.001 | [0.001] | -0.000 | [0.001] | 0.000 | [0.003] |
| AggLoss | 0.040*** | [0.005] | 0.040*** | [0.005] | 0.122*** | [0.017] |
| CF Constraint | 0.113*** | [0.011] | 0.113*** | [0.011] | 0.414*** | [0.036] |
| Intangibles | -0.075*** | [0.007] | -0.072*** | [0.007] | -0.205*** | [0.025] |
| PP&E | 0.011** | [0.005] | 0.011** | [0.005] | 0.045*** | [0.016] |
| R&D | 0.612*** | [0.055] | 0.624*** | [0.055] | 2.168*** | [0.180] |
| | | | | | | |
| Fixed Effects | Year & Country | | Year & Country | | Year & Country | |
| Observations | 133,783 | | 133,783 | | 133,783 | |
| R-Squared | 0.137 | | 0.056 | | 0.057 | |

This table presents OLS regression estimations of firm-level tax avoidance on GAAR. The dependent variables are three measures of tax avoidance. TaxAvoid is the ratio of total tax expense to pre-tax income (i.e., the effective tax rate) multiplied by negative one. TaxAvoid Ratio is the ratio of the effective tax rate to the country statutory tax rate (CSTR), multiplied by negative one. TaxAvoid Spread is computed as CSTR minus the effective tax rate. The primary independent variable of interest is GAAR, an indicator set equal to 1 for firm years ending after the GAAR effective date, zero otherwise. All variables are as defined in the Appendix. Standard errors are clustered at the firm level reported in brackets next to the coefficients. Year and country fixed effects are included, though coefficients are suppressed. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

**Table 6: Analysis of the effect of the presence of a GAAR and a history of high avoidance on tax avoidance**

| | (1) TaxAvoid | | (2) TaxAvoid Spread | | (3) TaxAvoid Ratio | |
|---|---|---|---|---|---|---|
| | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error |
| *Predicted Sign on GAAR*HI Avoider* | - | | - | | - | |
| **GAAR*HI Avoider** | -0.081*** | [0.005] | -0.080*** | [0.005] | -0.240*** | [0.015] |
| HI Avoider | 0.132*** | [0.004] | 0.132*** | [0.004] | 0.409*** | [0.012] |
| GAAR | 0.006 | [0.005] | -0.006 | [0.004] | -0.001 | [0.014] |
| CSTR | -0.517*** | [0.055] | | | | |
| Age | -0.010** | [0.005] | -0.009** | [0.005] | -0.031** | [0.015] |
| ROA | 0.341*** | [0.020] | 0.338*** | [0.020] | 1.047*** | [0.065] |
| Leverage | 0.009 | [0.008] | 0.007 | [0.008] | 0.019 | [0.024] |
| Size | -0.001 | [0.001] | -0.001 | [0.001] | -0.007** | [0.003] |
| BM | -0.001 | [0.001] | -0.001 | [0.001] | -0.003 | [0.004] |
| AggLoss | 0.032*** | [0.009] | 0.032*** | [0.009] | 0.094*** | [0.029] |
| CF Constraint | 0.065*** | [0.016] | 0.064*** | [0.016] | 0.245*** | [0.051] |
| Intangibles | -0.030*** | [0.010] | -0.031*** | [0.010] | -0.071** | [0.034] |
| PP&E | 0.005 | [0.006] | 0.006 | [0.006] | 0.027 | [0.021] |
| R&D | 0.424*** | [0.066] | 0.425*** | [0.067] | 1.491*** | [0.222] |
| | | | | | | |
| Fixed Effects | Year & Country | | Year & Country | | Year & Country | |
| Observations | 67,144 | | 67,144 | | 67,144 | |
| R-Squared | 0.195 | | 0.094 | | 0.090 | |

This table presents OLS regression estimations of firm-level tax avoidance on GAAR and tax authority enforcement. The dependent variables are three measures of tax avoidance. TaxAvoid is the ratio of total tax expense to pre-tax income (i.e., the effective tax rate) multiplied by negative one. TaxAvoid Ratio is the ratio of the effective tax rate to the country statutory tax rate (CSTR), multiplied by negative one. TaxAvoid Spread is computed as CSTR minus the effective tax rate. GAAR is an indicator set equal to 1 for firm years ending after the GAAR effective date, zero otherwise. HI Avoider is an indicator variable set equal to 1 for firms whose 3-year lagged tax avoidance in the year prior to GAAR implementation exceeded the median lagged tax avoidance of all other firms in that country-year. All variables are as defined in the Appendix. Standard errors are clustered at the firm level reported in brackets next to the coefficients. Year and country fixed effects are included, though coefficients are suppressed. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

**Table 7:  Analysis of the effect of weak tax enforcement on the association between the presence of a GAAR on tax avoidance**

| | (1) TaxAvoid | | (2) TaxAvoid Spread | | (3) TaxAvoid Ratio | |
|---|---|---|---|---|---|---|
| | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error |
| *Predicted Sign on GAAR*LO Enforce* | - | | - | | - | |
| **GAAR*LO Enforce** | -0.038*** | [0.005] | -0.042*** | [0.005] | -0.077*** | [0.017] |
| GAAR | -0.004 | [0.004] | -0.013*** | [0.004] | -0.041*** | [0.013] |
| CSTR | -0.500*** | [0.044] | | | | |
| Age | 0.002 | [0.002] | 0.002 | [0.002] | -0.001 | [0.008] |
| ROA | 0.350*** | [0.013] | 0.349*** | [0.013] | 1.096*** | [0.042] |
| Leverage | 0.012** | [0.005] | 0.011** | [0.005] | 0.020 | [0.017] |
| Size | -0.004*** | [0.001] | -0.004*** | [0.001] | -0.013*** | [0.002] |
| BM | -0.001 | [0.001] | -0.000 | [0.001] | -0.000 | [0.003] |
| AggLoss | 0.040*** | [0.005] | 0.040*** | [0.005] | 0.122*** | [0.017] |
| CF Constraint | 0.118*** | [0.011] | 0.119*** | [0.011] | 0.423*** | [0.036] |
| Intangibles | -0.074*** | [0.007] | -0.072*** | [0.007] | -0.204*** | [0.025] |
| PP&E | 0.010** | [0.005] | 0.010** | [0.005] | 0.043*** | [0.016] |
| R&D | 0.617*** | [0.055] | 0.629*** | [0.055] | 2.177*** | [0.180] |
| Fixed Effects | Year & Country | | Year & Country | | Year & Country | |
| Observations | 133,783 | | 133,783 | | 133,783 | |
| R-Squared | 0.137 | | 0.056 | | 0.057 | |

This table presents OLS regression estimations of firm-level tax avoidance on GAAR and tax authority enforcement.  The dependent variables are three measures of tax avoidance.  TaxAvoid is the ratio of total tax expense to pre-tax income (i.e., the effective tax rate) multiplied by negative one.  TaxAvoid Ratio is the ratio of the effective tax rate to the country statutory tax rate (CSTR),  multiplied by negative one.  TaxAvoid Spread is computed as CSTR minus the effective tax rate.  GAAR is an indicator set equal to 1 for firm years ending after the GAAR effective date, zero otherwise.  LO Enforce is an indicator variable set equal to 1 for observations in countries with tax enforcement falling below the median in the year prior to GAAR.  The Lo Enforce indicator variable is omitted because its effect is absorbed by the country fixed effects.  All variables are as defined in the Appendix.  Standard errors are clustered at the firm level reported in brackets next to the coefficients.  Year and country fixed effects are included, though coefficients are suppressed.  Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

**Table 8: Analysis of the effect of the presence of a GAAR and country burden of proof rule**

| | (1) TaxAvoid | | (2) TaxAvoid Spread | | (3) TaxAvoid Ratio | | (4) TaxAvoid | | (5) TaxAvoid Spread | | (6) TaxAvoid Ratio | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error |
| *Predicted Sign on GAAR*Burden* | - | | - | | - | | - | | - | | - | |
| **GAAR*Burden-Taxpayer** | -0.055*** | [0.006] | -0.062*** | [0.006] | -0.112*** | [0.020] | | | | | | |
| **GAAR*Burden-Shared** | -0.075*** | [0.007] | -0.084*** | [0.007] | -0.196*** | [0.023] | | | | | | |
| **GAAR*Burden-Taxpayer or Shared** | | | | | | | -0.064*** | [0.006] | -0.072*** | [0.006] | -0.150*** | [0.019] |
| GAAR | 0.014*** | [0.005] | 0.011** | [0.005] | 0.007 | [0.016] | 0.014*** | [0.005] | 0.011** | [0.005] | 0.009 | [0.016] |
| CSTR | -0.689*** | [0.044] | | | | | -0.676*** | [0.044] | | | | |
| Age | 0.004* | [0.002] | 0.005* | [0.002] | 0.006 | [0.008] | 0.004 | [0.002] | 0.004 | [0.002] | 0.004 | [0.008] |
| ROA | 0.339*** | [0.013] | 0.338*** | [0.013] | 1.062*** | [0.042] | 0.341*** | [0.013] | 0.339*** | [0.013] | 1.067*** | [0.042] |
| Leverage | 0.014** | [0.006] | 0.013** | [0.006] | 0.025 | [0.017] | 0.013** | [0.006] | 0.013** | [0.006] | 0.024 | [0.017] |
| Size | -0.004*** | [0.001] | -0.004*** | [0.001] | -0.015*** | [0.002] | -0.004*** | [0.001] | -0.004*** | [0.001] | -0.015*** | [0.002] |
| BM | 0.000 | [0.001] | 0.000 | [0.001] | 0.003 | [0.004] | 0.000 | [0.001] | 0.000 | [0.001] | 0.003 | [0.004] |
| AggLoss | 0.043*** | [0.005] | 0.043*** | [0.005] | 0.128*** | [0.017] | 0.043*** | [0.005] | 0.043*** | [0.005] | 0.129*** | [0.017] |
| CF Constraint | 0.109*** | [0.011] | 0.110*** | [0.011] | 0.394*** | [0.036] | 0.110*** | [0.011] | 0.110*** | [0.011] | 0.397*** | [0.036] |
| Intangibles | -0.075*** | [0.007] | -0.073*** | [0.007] | -0.208*** | [0.025] | -0.075*** | [0.007] | -0.073*** | [0.007] | -0.207*** | [0.025] |
| PP&E | 0.009* | [0.005] | 0.010** | [0.005] | 0.041*** | [0.016] | 0.009* | [0.005] | 0.009* | [0.005] | 0.040** | [0.016] |
| R&D | 0.620*** | [0.055] | 0.631*** | [0.055] | 2.175*** | [0.180] | 0.623*** | [0.055] | 0.633*** | [0.055] | 2.185*** | [0.180] |
| Fixed Effects | Year & Country | | Year & Country | | Year & Country | | Year & Country | | Year & Country | | Year & Country | |
| Observations | 129,675 | | 129,675 | | 129,675 | | 129,675 | | 129,675 | | 129,675 | |
| R-Squared | 0.143 | | 0.057 | | 0.057 | | 0.142 | | 0.057 | | 0.057 | |

This table presents OLS regression estimations of firm-level tax avoidance on GAAR and an indicator variable reflecting the burden of proof. The dependent variables are three measures of tax avoidance. TaxAvoid is the ratio of total tax expense to pre-tax income (i.e., the effective tax rate) multiplied by negative one. TaxAvoid Ratio is the ratio of the effective tax rate to the country statutory tax rate (CSTR), multiplied by negative one. TaxAvoid Spread is computed as CSTR minus the effective tax rate. GAAR is an indicator set equal to 1 for firm years ending after the GAAR effective date, zero otherwise. Burden-Taxpayer is an indicator variable set equal to 1 for observations in countries where the burden of proof falls on the taxpayer. Burden-Shared is an indicator variable set equal to 1 for observations in countries where the burden of proof is shared by the taxpayer and the tax authority. Burden-Taxpayer or Shared is an indicator variable set equal to 1 for observations in countries where the burden of proof either falls on the taxpayer or is shared by the taxpayer and the tax authority. All variables are as defined in the Appendix. Standard errors are clustered at the firm level reported in brackets next to the coefficients. Year and country fixed effects are included, though coefficients are suppressed. Significance levels are based upon two-sided t-tests and are indicated as follows: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

### Table 9
### Panel A:  Country-level analysis of the effect of the presence of a GAAR, controlling for other anti-avoidance policies

| | (1) CorpTaxRev | | (2) Median TaxAvoid | | (3) Median TaxAvoid Spread | | (4) Median TaxAvoid Ratio | |
|---|---|---|---|---|---|---|---|---|
| | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error |
| *Predicted Sign on GAAR* | + | | - | | - | | - | |
| **GAAR** | 0.520*** | [0.105] | -0.020*** | [0.006] | -0.024*** | [0.006] | -0.058*** | [0.017] |
| CSTR | 4.395*** | [1.062] | -0.503*** | [0.074] | | | | |
| Worldwide | 0.200 | [0.148] | -0.036*** | [0.007] | -0.033*** | [0.007] | -0.073*** | [0.017] |
| EarnVol | 0.010 | [0.016] | 0.000 | [0.001] | 0.001 | [0.001] | 0.004* | [0.002] |
| CFC, TP, & Debt Fixed Effects | Yes | | Yes | | Yes | | Yes | |
| Country Fixed Effects | Yes | | Yes | | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | | Yes | | Yes | |
| Observations | 354 | | 354 | | 354 | | 354 | |
| R-Squared | 0.876 | | 0.868 | | 0.716 | | 0.698 | |

This table presents OLS regression estimations of country-level corporate tax revenues and country-level tax avoidance on GAAR, controlling for the country-year presence of other anti-avoidance rules, including controlled foreign corporation rules, transfer pricing rules, and rules against debt manipulation, as outlined in Appendix C. The dependent variables are country-year revenue, CorpTaxRev, which is the corporate income tax collected by the jurisdiction for the year as a percentage of GDP, and country-year-median reported tax avoidance.  TaxAvoid is the ratio of total tax expense to pre-tax income (i.e., the effective tax rate) multiplied by negative one.  TaxAvoid Ratio is the ratio of the effective tax rate to the country statutory tax rate (CSTR),  multiplied by negative one.  TaxAvoid Spread is computed as CSTR minus the effective tax rate.  GAAR is an indicator set equal to 1 for firm years ending after the GAAR effective date.  All variables are as defined in the Appendix. Robust standard errors are reported in brackets next to the coefficients.  Year, country, and other anti-avoidance rule fixed effects are included as indicated, though coefficients are suppressed.  Significance levels are based upon two-sided t-tests and are indicated as follows: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

**Table 9**
**Panel B: Analysis of the effect of the presence of a GAAR on reported ETRs, controlling for other anti-avoidance policies**

| | (1) TaxAvoid | | (2) TaxAvoid Spread | | (3) TaxAvoid Ratio | |
|---|---|---|---|---|---|---|
| | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error |
| *Predicted Sign on GAAR* | - | | - | | - | |
| **GAAR** | -0.011*** | [0.004] | -0.020*** | [0.004] | -0.055*** | [0.013] |
| CSTR | -0.498*** | [0.045] | | | | |
| Age | 0.002 | [0.002] | 0.002 | [0.002] | -0.001 | [0.008] |
| ROA | 0.350*** | [0.013] | 0.349*** | [0.013] | 1.096*** | [0.042] |
| Leverage | 0.012** | [0.005] | 0.011** | [0.005] | 0.020 | [0.017] |
| Size | -0.004*** | [0.001] | -0.004*** | [0.001] | -0.013*** | [0.002] |
| BM | -0.001 | [0.001] | -0.000 | [0.001] | -0.000 | [0.003] |
| AggLoss | 0.040*** | [0.005] | 0.041*** | [0.005] | 0.122*** | [0.017] |
| CF Constraint | 0.118*** | [0.011] | 0.118*** | [0.011] | 0.420*** | [0.036] |
| Intangibles | -0.073*** | [0.007] | -0.070*** | [0.007] | -0.204*** | [0.025] |
| PP&E | 0.010** | [0.005] | 0.010** | [0.005] | 0.043*** | [0.016] |
| R&D | 0.619*** | [0.055] | 0.632*** | [0.055] | 2.181*** | [0.180] |
| | | | | | | |
| CFC, TP, & Debt Fixed Effects | Yes | | Yes | | Yes | |
| Country Fixed Effects | Yes | | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | | Yes | |
| Observations | 133,783 | | 133,783 | | 133,783 | |
| R-Squared | 0.137 | | 0.056 | | 0.057 | |

This table presents OLS regression estimations of firm-level tax avoidance on GAAR, controlling for the country-year presence of other anti-avoidance rules, including controlled foreign corporation rules, transfer pricing rules, and rules against debt manipulation, as outlined in Appendix C. The dependent variables are three measures of tax avoidance. TaxAvoid is the ratio of total tax expense to pre-tax income (i.e., the effective tax rate) multiplied by negative one. TaxAvoid Ratio is the ratio of the effective tax rate to the country statutory tax rate (CSTR), multiplied by negative one. TaxAvoid Spread is computed as CSTR minus the effective tax rate. The primary independent variable of interest is GAAR, an indicator set equal to 1 for firm years ending after the GAAR effective date, zero otherwise. All variables are as defined in the Appendix. Standard errors are clustered at the firm level reported in brackets next to the coefficients. Year, country, and other anti-avoidance rule fixed effects are included, though coefficients are suppressed. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

**Table 10: Analysis of the effect of the presence of a GAAR on reported ETR volatility**

| | (1) TaxAvoid Vol | | (2) TaxAvoid Spread Vol | | (3) TaxAvoid Ratio Vol | |
|---|---|---|---|---|---|---|
| | Coefficient | Std Error | Coefficient | Std Error | Coefficient | Std Error |
| *Predicted Sign on GAAR* | - | | - | | - | |
| **GAAR** | -0.026*** | [0.007] | -0.029*** | [0.005] | -0.046*** | [0.015] |
| CSTR | 0.074 | [0.091] | | | | |
| Median Age | 0.008** | [0.004] | 0.008** | [0.004] | 0.027** | [0.011] |
| Median ROA | -0.708*** | [0.027] | -0.717*** | [0.027] | -2.219*** | [0.084] |
| Median Leverage | 0.081*** | [0.008] | 0.083*** | [0.008] | 0.244*** | [0.025] |
| Median Size | -0.010*** | [0.001] | -0.010*** | [0.001] | -0.033*** | [0.003] |
| Median BM | 0.002 | [0.002] | 0.002 | [0.002] | 0.005 | [0.005] |
| Median CF Constraint | -0.248*** | [0.026] | -0.251*** | [0.026] | -0.733*** | [0.083] |
| Median Intangibles | 0.012 | [0.011] | 0.012 | [0.011] | 0.051 | [0.034] |
| Median PP&E | -0.038*** | [0.007] | -0.039*** | [0.007] | -0.108*** | [0.020] |
| Median R&D | 0.231*** | [0.064] | 0.241*** | [0.065] | 0.729*** | [0.196] |
| Fixed Effects | Year & Country | | Year & Country | | Year & Country | |
| Observations | 46,379 | | 46,379 | | 46,379 | |
| R-Squared | 0.105 | | 0.105 | | 0.100 | |

This table presents OLS regression estimations of firm-level tax avoidance on GAAR. The dependent variables are five-year rolling standard deviations of three measures of tax avoidance. TaxAvoid is the ratio of total tax expense to pre-tax income (i.e., the effective tax rate) multiplied by negative one. TaxAvoid Ratio is the ratio of the effective tax rate to the country statutory tax rate (CSTR), multiplied by negative one. TaxAvoid Spread is computed as CSTR minus the effective tax rate. The primary independent variable of interest is GAAR, an indicator set equal to 1 for firm years ending after the GAAR effective date, zero otherwise. All variables are as defined in the Appendix. Standard errors are clustered at the firm level reported in brackets next to the coefficients. Year and country fixed effects are included, though coefficients are suppressed. Significance levels are based upon two-sided t-tests and are indicated as follows: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.