

Tax Planning through Advanced Tax Rulings – An Exploratory Analysis Using the Luxembourg Tax Leaks

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ABSTRACT

Using leaked Luxembourg advanced tax rulings (ATRs), we examine determinants of ATRs and their tax planning outcomes. The determinants of receiving an ATR differ between financial services firms and industrial firms. The market responds positively to firms sharing similar characteristics of ATR firms. ATR firms realize lower effective tax rates and most of the ATR attributes are associated with tax avoidance. More importantly, while ATRs provide a sense of certainty in Luxembourg, ATRs and many ATRs attributes lead to higher overall tax uncertainty. However, this heightened tax uncertainty on average does not lead to an increase in future tax risk.

Keywords: advanced tax ruling; tax planning; Luxembourg leak

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1. Introduction

The use of sophisticated tax planning techniques by multinational entities (MNEs) has drawn scrutiny from policymakers and media around the world. G20 leaders believed that tax planning opportunities present in the increasingly global and digital economy were so abundant that in 2013 they asked the Organization for Economic Co-operation and Development (OECD) to draft an action plan to curtail global tax avoidance activities. This project became known as the “Base Erosion and Profit Shifting (BEPS)” project. A major issue that both policymakers and academics face when analyzing international tax avoidance behavior is the difficulty in obtaining detailed information on the nature of transactions used to avoid tax from publicly available firm disclosures and/or proprietary datasets (e.g., Bureau of Economic Analysis). We overcome this data constraint, to an extent, by focusing on a sample of MNEs that received private advanced tax rulings (ATRs) from the Luxembourg Tax Inspector.

On November 5, 2014, the International Consortium of Investigative Journalists (ICIJ) made publicly available ATRs of PwC Luxembourg clients that were leaked to them by a PwC employee. The leak included 548 ATRs from over 350 companies. An ATR is a legal agreement between a taxpayer and a taxing authority, where the taxpayer gives pertinent facts and circumstances of a transaction to the taxing authority and requests certainty over how the transaction will be taxed. In the United States, taxpayers can similarly obtain certainty by requesting a private letter ruling. However, unlike in Luxembourg where these documents remain private, the U.S. rulings are later redacted and become a part of the common law. Most of the leaked rulings provided by the Luxembourg Tax Inspector are

very detailed, showing organizational structures, copies of internal financing agreements, and step-by-step plans for their proposed transactions. It is this richness in information that we exploit in order to provide greater insight into the black box of international tax planning.

Several studies have used the LuxLeaks data release date in an event study framework to examine market reactions surrounding the leak (Nesbitt et al. 2017; Huesecken et al. 2018) and the efficacy of advanced tax rulings in reducing tax burdens (Huesecken and Overesch 2015). We differ from them by making use of the content of advanced tax rulings rather than the mere presence of rulings. Our goal is threefold. First, we provide a rich descriptive analysis of the types of transactions that firms receive ATRs on. This contributes to the current tax planning literature by providing new insight into the underlying mechanisms of tax planning behavior. Second, we analyze the determinants of receiving an ATR. These determinants help shed light on whether these firms differ from a large cross-section of multinational firms traded on U.S. exchanges and can help academics and/or investors identify firms that receive ATRs. Third, we examine tax outcomes (i.e., tax avoidance, tax uncertainty, and future tax risk) for firms receiving ATRs relative to their peers. Unique to our study, we make use of heterogeneity in ATRs to determine whether certain ATR characteristics have a greater influence on tax outcomes.

We begin our empirical analysis by examining a sample of tax rulings of firms listed on U.S. exchanges and provide a detailed analysis of the tax transactions for which MNEs receive ATRs. We document the proclivity and determinants of particular types of transactions, such as the use of hybrid debt instruments (Mills and Newberry 2005; Johannesen 2014), internal capital movement (Desai et al. 2004; 2007), and tax haven use (Hines and Rice 1994). Transactions using these vehicles to avoid tax have been of particular focus in the OECD's BEPS project. Therefore, a thorough analysis of their usage

within the Luxembourg Leaks sample is of interest to academics and regulators alike. ATRs in our sample are economically meaningful, with a mean transaction value of about \$2 billion. The most common purpose of transactions to which the ATRs apply is internal financing/reorganization. In general, these transactions are complex, involving an average of ten steps to complete. Likewise, these transactions generally include entities in multiple countries, new intercompany notes, and the formation of new subsidiaries. The majority of rulings are from the manufacturing and financial industries. While all of the ATRs in our sample pertain to firms traded on U.S. exchanges, 86 of our rulings are from U.S.-incorporated firms and 55 are from foreign-incorporated firms.

To conduct multivariate analysis, we link our ATR data to the Compustat universe. We evaluate whether certain firm attributes are associated with the likelihood of receiving an ATR. To do this, we make use of a sample of control firms representing the broader cross-section of MNEs. Much of the tax planning literature eliminates financial firms from the sample.¹ However, given that they make up a meaningful proportion of our ATR sample, we retain them and analyze them separately from industrial (i.e., non-financial) firms. One concern with the Luxembourg Leaks data is that it only contains ATRs for one Big 4 accounting firm's (i.e., PwC's) tax clients over a certain period of time.² Thus, there may be many more ATRs in the population than we are able to observe in our sample. If on average, MNEs in our control sample have ATRs that we are not able to observe, our ability to find significant determinants of ATRs in our model will be reduced.

When analyzing ATR determinants for financial firms, we find that leverage is negatively associated with the likelihood of receiving an ATR while size is positively associated. This is consistent with prior literature that debt and other tax planning tools

¹ Sample selection criteria are based on attributes of firms obtaining ATRs.

² Note that the PwC tax clients use PwC as their auditor in less than 40 percent of ruling firm-years.

are substitutes (Graham and Tucker, 2006; Li and Ma 2019). For industrial firms, we find that size, ROA, and the proportion of foreign income to total income are positively associated with the likelihood of receiving an ATR, while accruals are negatively associated. Depending on model specification, we have an area under the ROC curve between 77 and 88 percent, suggesting good predictive ability. We test this predictive ability in additional analysis by using point estimates from the determinants model to create a score for the likelihood of receiving an ATR. We regress 3-day cumulative abnormal returns (CARs) around the first leak date for non-ATR firms on this likelihood score. We find that CARs are increasing in the likelihood of obtaining an ATR. This result suggests that market participants are able to evaluate the likelihood of receiving an ATR. It also suggests a positive information spill-over effect for non-ruling firms, which is novel to the tax literature.

Next, we examine tax outcomes for ATR firms relative to control firms. We begin by re-examining tax avoidance outcomes, as a baseline, to ensure that the tax avoidance results in our sample are consistent with other Luxembourg Leaks studies. We then take the analysis deeper by examining different ATR characteristics to determine whether there are cross-sectional differences in the association between receiving an ATR and tax outcomes. In particular, we examine two ATR types (i.e., ATRs that pertain to internal financing and those that do not) and three ATR attributes (i.e., the use of hybrid instruments/entities, non-income tax avoidance, and a summary measure of ATR complexity).³ It is important to note that all ATRs in our sample are classified as having an ATR type, but the other attributes are based on data availability in the underlying rulings. In all tax planning

³ Hybrid arrangements are designed to arbitrage differences in tax code. For example, a company may choose to be classified as a flow-through entity for U.S. tax purposes to avoid the anti-deferral rules but a corporation for Luxembourg tax purposes.

specifications, we first analyze these characteristics in isolation, then we compare across ruling types, and interact ruling attributes with ruling types.

First, we find that receiving an ATR results in lower tax burdens and when we examine each ATR type and attribute in isolation, we find that nearly all of them are associated with a higher level of tax avoidance. Unconditionally, hybrid arrangements only appear to be an effective tax avoidance tool in financial services firms and therefore we present a more nuanced result than Hardeck and Wittenstein (2018) who pool all firms (i.e., financial and non-financial) for their analyses. Next, when we interact ruling attributes with ruling types (i.e., internal financings vs. non-internal financing), the largest reductions in three-year GAAP ETR for financial services firms are obtained from hybrid arrangements as a part of an internal financing transaction. However, for industrial firms, non-internal financing transactions result in the largest reduction in three-year GAAP ETR.

In our tax uncertainty tests, we find that despite ATRs helping firms gain tax certainty in Luxembourg, many ATR firms record higher unrecognized tax benefits than controls firms. This suggests that while ATRs increase certainly in Luxembourg, these transactions could lead to higher uncertainty in other taxing jurisdictions. As a baseline, we find that the association between the presence of an ATR and higher unrecognized tax benefits is primarily driven by more complex rulings and non-internal financing ATRs. In the interacted analysis, we find that non-internal financing ATRs increase uncertainty in every specification for both financial and industrial firms. Finally, we find some evidence that obtaining an ATR reduces future tax risk. In particular, among financial firms, internal financing ATRs involving less complex transactions result in a lower future standard deviation of cash ETRs. Among industrial firms, we find fairly consistent results that non-internal financing ATRs lead to a reduction in future tax risk. Thus, while many rulings result in recording an unrecognized tax benefit, we do not see any evidence of an increase in

future tax risk, and often find a modest reduction in future tax risk. When combined with the results from Robinson et al. (2016), that only 24 percent of UTBs are resolved through settlements, and Gleason et al. (2018) that suggest FIN48 does not improve the accuracy of tax reserves, our result provide another piece of evidence for standard setters on the efficacy and conservativeness of the reporting requirements under FIN48.

Our study makes several contributions to the public finance literature. First, we overcome data limitations inherent in using archival data to examine the mechanisms of tax avoidance. The nature of the Luxembourg Leaks data enables a rich understanding of tax planning as firms often provide abundant detail of the transactions that they are seeking an ATR for. Second, we are able to contribute to a large stream of literature that examines how country-level tax policies impact firms' decisions. In particular, the OECD, EU, U.S. Congress and many other governments are all attempting to understand factors that influence global within-organization capital movement. Even though the ATRs that we examine are a legal form of tax avoidance, at least in Luxembourg, they can potentially point to characteristics of other forms of tax avoidance. Our unique dataset allows insight into transactions used by multinational firms to move capital through organizations in a tax efficient manner.

We contribute to several streams within the tax literature. First, unlike the majority of tax studies that drop financial services firms from the analysis, we provide insight into both financial and industrial firms and identify interesting differences between the two groups. Given that financial services firms account for a significant portion of the economy, understanding the tax planning efforts of this sector is important. Second, we conclude that non-income tax avoidance provisions in ATRs are likely complements to income tax avoidance as evidenced by the use of non-income tax avoidance leading to an increased level of income tax avoidance (Robinson 2012). This result increases our understanding of non-

income tax avoidance, an area that has been under-studied relative to income tax avoidance (Dyreng and Maydew 2018). Third, the focus on the Luxembourg Leaks allows us to gain a better understanding of specific transactions firms are using to achieve their tax planning goals. In particular, these insights contribute to the literature that examines the role of organizational structures in tax planning (Lewellen and Robinson 2013), hybrid arrangements (Mills and Newberry 2005) and income shifting transactions (Klassen and Laplante 2012). Fourth, we document nuanced associations between transactions that reduce tax expense and how they relate to tax uncertainty (Dyreng et al. 2019) and tax risk (Guenther et al. 2017).

This paper proceeds as follows. Section 2 reviews the tax planning literature. Section 3 describes the Luxembourg Tax leaks and our sample selection process. Section 4 discusses empirical results. Section 5 summarizes and concludes.

2. Background on Luxembourg Leaks and Literature on Tax Planning

2.1. Advanced tax rulings

Many jurisdictions offer some form of advanced tax rulings (ATRs). Generally, these rulings are a means for taxpayers to gain clarity on how a certain transaction or stream of income will be treated for tax purposes. A taxpayer does not need to have tax avoidance as their primary motive for seeking an ATR. In many circumstances, taxpayers are simply seeking reassurance that they are correctly interpreting the tax law and applying it to the facts and circumstances of a given transaction. For example, in the U.S., there has been a recent wave of firms converting from C corporations to real estate investment trusts (REITs). This conversion process often includes altering their current business and ensuring that they meet several safe harbor tests in the tax law. Most of these firms will request a private letter ruling from the IRS to ensure that they are eligible for the

conversion and have correctly arranged their affairs to be considered REITs. For another example, Ireland has offered Apple state aid with tax rulings that enable Apple's Irish affiliates, along with other tax planning techniques, to pay little income tax (Markle and Robinson 2018).

Luxembourg is an important country in the international tax planning landscape thanks in part to its extensive tax treaty network, its lucrative tax incentives, and its stable political and economic environment. Despite being a member of the EU, Luxembourg is generally considered a tax haven. The focus of our study is the content of leaked Luxembourg ATRs. The leaked ATRs were made available to the ICIJ by PwC employees in two batches. The first, the larger leak, consists of 548 documents, and was made public in November of 2014. The second, and the smaller leak, was made public in December of 2014.⁴

Nesbitt et al. (2017) and Huesecken et al. (2018) examine the market reaction surrounding the release of the Luxembourg Leaks documents by the ICIJ. Arguing that the leak provided the market with new information regarding the certainty of firms' tax strategies, both papers document a positive market reaction during the event window for firms involved in the leak. Huesecken and Overesch (2015) examine tax outcomes for leak firms and find that firms receiving ATRs realize lower GAAP and cash ETRs relative to a control group, suggesting that transactions on which firms are receiving ATRs aid firms in avoiding taxes.

Many of the advanced tax rulings made public in the Luxembourg Leaks deal with the structuring of transactions to allow capital to be moved through a multinational enterprise

⁴ It should be noted that the leaked documents are digital copies of the actual original source documents that were submitted to the Luxembourg Tax Inspector, not purely a database from ICIJ listing the firms involved. Other jurisdictions have brought tax cases against firms involved in the leak. For example, Accenture settled a tax claim brought against them by Switzerland pertaining to transactions disclosed in the Luxembourg Leaks for \$200 million. This provides some assurance that the transactions disclosed in these documents are in fact real and material.

in a tax-efficient manner. This involves choices such as entity locations, the legal and organizational forms of the entities, how to structure instruments to move capital within entities, etc. The tax literature has documented the importance of tax considerations in designing foreign ownership structures (Lewellen and Robinson 2013), the rise and the location of holding companies (Murphy 2018; Dyreng et al. 2015), and legal forms (e.g., partnerships versus corporations) of particular entities (Shevlin 1987; Goolsbee 2004; Goolsbee and Maydew 2002; Utke 2019). Therefore, we anticipate that tax considerations play an important role in how transactions documented in leaked ATRs are designed.

A prevalent feature among rulings is the use of hybrid entities and financial instruments. Several studies have acknowledged the tax benefits of hybrid arrangements (Mills and Newberry 2005; Rosenbloom 2000; Johannesen 2014). However, due to data constraints, it is typically difficult for academics to observe these arrangements. Of particular interest to our setting and analysis, Marian (2017) and Hardeck and Wittenstein (2018) both document a high level of hybrid arrangement usage among firms receiving ATRs in Luxembourg. We build upon these studies in three distinct ways: 1) by examining whether the effect of hybrid arrangements on ETRs varies cross-sectionally with other ATR characteristics, 2) by separately analyzing financial MNEs, and 3) by examining the role of hybrid arrangements on tax uncertainty and tax risk.

In addition to the Luxembourg Leaks, a series of other leaks have also exposed information about firms' international tax planning efforts to the public. Utilizing a dataset of firms exposed through the Offshore Leaks, Panama Papers, and Bahamas Leaks, Li and Ma (2019) document that exposed firms increase leverage in the post-leak period in anticipation that they will not be able to generate the same level of cash tax savings from their international tax planning strategies after details of these strategies have been made

public. In addition, O'Donovan et al. (2019) find that firms named in the Panama Papers experience a negative market reaction.

2.2. *Prior literature on tax planning activities among U.S. multinationals*

There is an extensive body of research documenting that MNEs engage in a variety of tax planning strategies that range from simple tax avoidance strategies, such as filing R&D tax credits, to much more aggressive tax planning, such as tax shelters.⁵ However, few studies have examined the underlying mechanisms and strategies that allow firms to minimize their tax expenses.⁶ We focus on legal tax avoidance where firms seek certainty in their tax planning from a taxing authority, in this case the Luxembourg Tax Inspector, in the form of advanced tax rulings. This topic relates to a number of interconnected streams of literature. We limit our discussion, for brevity, to those directly associated with international tax planning and their outcomes.

A unique stream of literature examines firms' tax-motivated income shifting behavior (Dyreng and Markle 2016; De Simone 2016). In these settings, firms strategically use intercompany transactions in an attempt to recognize as much profit as possible in low-tax jurisdictions and as little profit as possible in high-tax jurisdictions. There is strong empirical and theoretical support that firms engage in these transactions. However, to date, our understanding of the underlying transactions that firms use to reduce tax has been hampered by their unobservable nature. Instead, researchers have been relying extensively on empirical proxies that often assume that high *ex post* realization of profit in low-tax jurisdictions is a symptom of income shifting (Hines and Rice 1994; Klassen and Laplante

⁵ See Hanlon and Heitzman (2010) and Dharmapala (2014) for reviews of this literature. Additionally, some firms attempt to defraud local taxing authorities through tax evasion (Crocker and Slemrod 2005). The discussion of tax evasion is outside the scope of this paper.

⁶ A notable exception is Brown (2011) who examines a specific type of tax shelter (COLI). The focus of her paper is not on how firms implement this type of transactions but rather how knowledge of this tax shelter spreads.

2012). A common theme among income shifting studies is tax haven use (Desai et al. 2006; Dharmapala and Hines 2009; Dyreng et al. 2013). In particular, Desai et al. (2006) document that the primary reason that firms use large tax haven countries is to physically shift taxable income by locating operations in the country. However, the primary use of small tax haven countries is to facilitate the deferral of U.S. taxation on foreign income. As such, many of the organizational structures we observe in ATRs make use of tax haven affiliates, including many outside of Luxembourg, to facilitate intercompany capital movement.

In addition to international tax planning affecting the overall taxability of a firm, the underlying transactions may also alter the uncertainty or risk associated with tax avoidance activities. Towery (2017) suggests that international operations and transfer pricing schemes are among the top sources of uncertainty associated with tax positions. Klassen et al. (2017) examine a subset of firms that heavily focus on tax compliance in setting their transfer pricing strategies and find that these firms report lower unrecognized tax benefits. Dryeng et al. (2019) suggest that tax avoidance and tax uncertainty are, on average, positively correlated, and this association is more pronounced in firms that use tax havens. In contrast, Guenther et al. (2017) document that tax avoidance appears to be independent of future tax risk. We differ from these later two studies in that we examine underlying transactions that may simultaneously affect *ex post* proxies for tax avoidance, uncertainty, and risk.

Overall, while the literature on tax planning is large, observing how particular organizational structures, transactions, and/or contracts are used by MNEs to achieve lower taxes has been difficult. The Luxembourg Leaks provides a unique opportunity, albeit for a limited subset of MNEs, for researchers to gain a more in-depth understanding of how MNEs structure their operations and transactions to avoid tax.

3. Luxembourg Leaks Data Collection and Sample Selection.

We collect from the ICIJ's website (as of November 2017) all available leaked Luxembourg advanced tax rulings. The rulings are in a .pdf format and each ruling usually includes a background or summary section, technical analysis of the transaction, steps to implement the transaction, and a series of appendices with institutional details (e.g., organizational structures, terms of notes, etc.).⁷ We provide examples of key information we collect in Appendix B.

We create a sample from these Luxembourg ATRs for firms publicly listed on U.S. stock exchanges. We start with the list of firms in the Nesbitt et al. (2017) sample. Their goal is to examine stock market reactions whereas we examine the content of the rulings. Accordingly, we remove rulings that are not in English and include additional firms that meet our sample-selection criteria. We report our sample in Table 1. We have 78 unique firms that have received a total of 141 ATRs. The majority of firms have one or two rulings (66 firms), with 12 firms having between three and seven rulings. Not all rulings are in the same format and there is heterogeneity in the amount of transaction details provided. Therefore, the sample size for each particular test changes depending on data availability and the nature of the test.

In Panel B of Table 1, we present the distribution of our ATR observations by country of incorporation and time. The majority of the rulings are associated with U.S.-incorporated MNEs (86 of 141). Other common jurisdictions of incorporation in our sample are Ireland (e.g., Accenture, Shire, Warner Chilcott, and Covidien), Bermuda (e.g., Arch Capital, Weatherford Intl., and White Mountains Insurance) and the UK (e.g., Aviva, British

⁷ For additional discussion on the administrative nature of the ruling (e.g., timing) see Marian (2017).

American Tobacco, GSK, HSBC, Barclays, and Vodafone). The majority of leaked rulings occur from 2008 to 2010, with a handful occurring from 2003 to 2007. Of the 141 total rulings, we have 102 unique ruling-years. Despite all firms being a PwC tax client, the auditors for these firms are reasonably well distributed (EY 14; Deloitte 32; KPMG 16; PwC 39; and Grant Thornton 1).⁸

To our knowledge, the data we have collected represent the most extensive dataset on actual tax avoidance and income shifting transactions. Accordingly, the data warrant some discussion to ground the readers. Our data collection process involved a systematic collection of items that can be quantified from the tax rulings. Whenever there was ambiguity over how to treat a certain item, multiple people reviewed the same transaction to reach a consensus. If a consensus could not be met the data item was intentionally left blank. Despite our best effort, some items are still subjective and different data collectors can come to different conclusions. We applied a conservative data collection approach. For example, the use of hybrid debt-equity instruments is prevalent, but often difficult to ascertain. To avoid different treatments, we considered all interest free loans (IFL), mandatory redeemable preferred shares (MRPS), profit participating loans (PPL), convertible preferred equity certificates (CPEC or PEC), and any ruling that specifically states the instrument is considered debt in one jurisdiction and equity in another as a hybrid instrument. Although this dataset may have some limitations, it does provide a sample of firms that control over \$15.6 trillion in assets and a market value of equity of \$1.6 trillion in 2009.

We categorize the general purpose of each transaction as: internal financing and reorganizations, investments and divestitures, tax certainty, and intangible property. For

⁸ Three of the rulings in our sample were not obtained by PwC.

the purpose of most analyses, we compare internal financing and non-internal financing transactions. We examine the following three categories of ruling attributes:

- **Hybrid Mismatches:** These are arrangements where a firm either arbitrages differences in the treatment of entity classification (corporation versus partnership/flow through) or capital structure (debt versus equity) to avoid taxation in one jurisdiction or both. For example, if one jurisdiction views an instrument as debt whereas another views it as equity then the firm can benefit from the tax benefit of deductible interest while receiving tax preferred dividends.
- **Non-income Tax:** Despite the general focus of the accounting literature on income taxes, non-income tax issues are also often present in many transactions. Within these advanced tax rulings we see two particularly common non-income taxes. The first is withholding tax, which represents “toll charges” for payments that leave a country’s taxing jurisdiction.⁹ These are fairly common on mobile income payments (e.g., interest, royalties, dividends, etc.). The second is a Luxembourg net wealth tax, which is set up as a rate for assets but allows for certain exemptions, particularly for equity holdings. While withholding taxes in some instances will impact GAAP ETRs, we hope to examine whether non-income tax avoidance is associated with income tax avoidance and other tax planning outcomes similar to Robinson (2012). There is another reason to examine non-income tax avoidance and its association with income tax avoidance. Non-income tax avoidance and income tax avoidance can be correlated. Non-income tax liability can simply be the result of the accumulation of many periods of income tax avoidance. Therefore, non-income tax avoidance can potentially in turn affect income-tax avoidance.

⁹ Withholding taxes are generally creditable in the foreign tax credit (IRC §§901-904). Despite this, they are not based on income, but rather the movement of funds between jurisdictions.

- **ATR Score:** We create a composite score that includes variables associated with organizational structure, organizational form, capital movement, non-income tax avoidance, etc. in order to gauge the complexity of the ruling. We assume that these characteristics are increasing in the complexity of the transaction.

4. Empirical Analysis

4.1. Descriptive statistics

We begin our analysis by providing a detailed description of the data. We provide descriptive statistics on more ruling attributes than what we actually use in multivariate analyses. For example, only 28 firms disclose information on partnerships, which would severely limit the sample size for multivariate analysis. However, future research can investigate why many internal partnerships have such an extreme ownership split within the internal organizational structures (at the median 99.85 percent versus 0.15 percent).

In Panel A of Table 2, we report summary statistics on the nature of transactions for which ATRs are being secured. For the 93 firms that report a transaction value, the average transaction is close to \$2 billion. Even though this amount is right skewed, at the 25th percentile, the rulings still cover a non-trivial \$60 million. Next, the average transaction includes the use of affiliates in three countries (other than Luxembourg) and the average transaction has about 10 steps.¹⁰ These transactions also include, on average, the creation of two new intercompany notes and two new subsidiaries. Finally, we categorize the general purpose of each transaction as: internal financing and reorganizations, investments and divestitures (which include M&A, spin offs, liquidations,

¹⁰ We observe the use of 49 different jurisdictions (other than Luxembourg) in our sample. Jurisdictions that appear most often (in order of frequency) are: United States, United Kingdom, Gibraltar, Ireland, Switzerland, Netherlands, Canada, Bermuda, and the Cayman Islands.

post-merger integrations, etc.), tax certainty, and intangible property.¹¹ The largest group is internal financing and reorganizations. For the purpose of subsequent multivariate regression analysis, we combine the later three into a category termed non-financing transactions.

In Panel B of Table 2, we present summary statistics of ATR characteristics by industry (SIC1). These include the number of rulings per industry, the mean and median values of transactions, and general purposes of transactions. A majority of firms are in either manufacturing (SIC 2 and 3) or the financial services industry (SIC 6). Our ability to provide insight into tax planning activities by financial services firms is a contribution to the tax literature as these firms are often excluded from prior tax studies.¹²

While all our sample firms are traded on U.S. exchanges, in Panel C of Table 2, we separate rulings between firms incorporated inside (U.S. incorporated) and outside (non-U.S. incorporated) of the U.S. We note some minor differences between these two samples, but the fact that both groups have a mean transaction value close to \$2 billion appears to indicate that obtaining a ruling is meaningful among both samples and the value of the transactions are split relatively symmetrically between firms incorporated within or outside the U.S.

Panel A of Table 3 contains descriptive statistics on firms' foreign affiliates' organizational forms and structures. A large number of tax planning transactions hinge on whether a given entity within its organizational structure is considered a corporation or a flow-through in the eyes of a particular taxing jurisdiction. Due to data limitations,

¹¹ Marian (2017) states that the most common reasons for seeking an advanced tax ruling in Luxembourg are Luxembourg residence determination, margin on back-to-back notes, thin-capitalization, and debt-equity classification. We use a broader classification scheme. The category of tax certainty is somewhat a catch-all category as it represents rulings that are narrower in scope and may simply want confirmation that changing a functional currency is acceptable under a previous ruling. In many cases, firms seek a ruling on a number of interrelated items that may be associated with its internal capital market, reorganization, or recent acquisition. In these cases we code these transactions to multiple categories.

¹² We refer to all non-financial firms as industrial firms throughout our empirical analysis.

academic insight on this area is minimal. However, our data allow us to provide a more thorough examination of entity classifications. We quantify the greatest disclosed split in partnership allocations based on observed allocation of partnership interests in the ATRs. Among the 28 firms that use partnerships and disclose allocation data in the ATR, four observations are 50/50 split joint ventures and over half have an allocation of greater than 99.85 percent versus 0.15 percent. This result can be of interest to policymakers because if tax planning requires only a small proportional ownership of a partnership then changing the requirements for partnership formation can be a low cost and effective means to curb tax planning. Next, we examine the number of hybrid entities within the transaction. Hybrid entities are entities that are classified as a flow-through (i.e., branch, partnership, etc.) from one jurisdiction's perspective but as a corporation from another jurisdiction's perspective. This mismatch enables firms to capitalize on certain tax treatment only available to a certain type of entity within a jurisdiction, or enables their affiliates to make intercompany payments without being subject to anti-abuse rules (e.g., U.S. Subpart F regime). It is important to note that our ability to classify hybrid entities is almost entirely limited to U.S.-incorporated firms. We observe about two hybrid entities per ATR of U.S.-incorporated firms (full sample average 1.44).

Next, we examine three aspects of a firm's organizational structure. They include the number of disregarded entities that flow into a common holding company, the depth of a firm's organizational structure, and tax haven use. Firms on average report about two disregarded entities flowing into a common holding company (over two among U.S.-incorporated firms) and an organizational structure of 6.5 entities deep. This differs significantly from Lewellen and Robinson (2013) who report that the average chain length

in 2009 is 2.5 entities deep.¹³ In addition, the organizational structures depicted in these leaks are abbreviated structures that only include the portion of the organization that the proposed transaction pertains to. Therefore, the 6.5 is likely only a lower bound of the actual depth of corporate structure. Our data also appear to have a larger right tail than the sample in Lewellen and Robinson (2013). Our 99th percentile (untabulated) is 15 affiliates deep compared to their 99th percentile of 7 affiliates deep. We do not report the presence of cross-country ownership links as every ruling that depicts or describes an organizational structure has at least one cross-country link. Finally, 70 percent of tax rulings depict the presence of a tax haven affiliate outside of Luxembourg and over half the foreign rulings are from firms headquartered in a tax haven. Thus, tax havens are an important component of the transactions for which ATRs are being sought.

In Panel B of Table 3, we present items related to internal capital markets and tax planning. Given that most of the rulings cover intercompany financing, to some degree, it is not surprising that a large portion of ATRs in our sample are seeking certainty around intercompany lending activities. Hybrid debt-equity instruments take advantage of differences in the definition under the tax law of debt and equity between jurisdictions, enabling one entity within a controlled group to receive a tax deduction for an interest payment while the other entity within the controlled group enjoys a preferential tax rate on dividend income. Over half of the sample uses hybrid debt instruments as a tax planning tool and many rulings include more than one of these instruments. Among a sample of firms that disclose the value of intercompany lending, we find the largest note in the transaction to be \$2.4 billion on average.¹⁴ Next, 46 percent of firms discuss debt-equity

¹³ We would define this as 3.5 by adding the parent corporation.

¹⁴ Many firms seek to receive certainty on the taxable basis points of on-lending activities. However, we do not report those results as they are formulaic with fewer taxable basis points when firms increase the magnitude of their on-lending activities.

ratio requirements (85 percent -15 percent in most situations), 70 percent attempt to avoid withholding taxes, 78 percent request certainty around tax residence, and 65 percent desire to avoid Luxembourg's net wealth tax. These statistics on withholding taxes and net wealth tax heed Dyreng and Maydew's (2018) call for more research on the avoidance of non-income taxes.

In Panel C of Table 3, we describe currencies used by the top holding companies, or the holding companies obtaining ATRs. Paradoxically, more holding companies in Luxembourg use the U.S. dollar when the ultimate parent is incorporated outside of the U.S. Furthermore, many firms have back-to-back loans in the same denomination to avoid foreign exchange exposure. Six percent of firms explicitly state that they hedge this currency risk.

In Table 4, we report descriptive statistics for variables used in our multivariate analyses. We report descriptive statistics separately for financial firms and industrial firms. Industrial firms have a slightly higher mean three-year GAAP effective tax rate (31.7 percent) than financial firms (28.6 percent). On average, financial firms in our sample report higher UTBs (logged UTB of 3.529) relative to industrial firms (logged UTB of 2.808). In addition, financial firms in our sample appear to have more volatile cash ETRs (0.706) than industrial firms (0.468). Finally, financial firms have slightly higher leverage than industrial firms and a lower level of accruals.

4.2. Luxembourg tax rulings and tax planning

We begin with an empirical analysis examining the determinants of obtaining a tax ruling. We extend Brown (2011), Lisowsky (2010) and Wilson (2009) who each examines tax sheltering. Our setting is somewhat unique from their settings in that while our firms are using highly structured and sophisticated tax planning strategies, they are at least being

transparent with a taxing authority (in our case, the Luxembourg Tax Inspector) in order to gain certainty on the tax positions of their transactions.

In order to understand the likelihood and outcomes associated with obtaining an advanced tax ruling, we need to create a control group. We compare our firms to a broader cross-section of MNEs as it is probable that many firms are obtaining some sort of advanced tax rulings. Similar to the discussion in Lisowsky (2010) and Ayers et al. (2019), we aim to use minimal screens in order to utilize greater cross-sectional variation in our determinants.¹⁵ In general, our ruling firms are large MNEs. Therefore, to be included in our control sample, we require firms to report foreign income, have at least \$150 million in assets, and have a Big 4 auditor.¹⁶ While seven of our 141 rulings pertain to tax years prior to 2008, the majority of the sample is from 2008-2010. Therefore, we limit our control sample observations to those years. In addition, we do not allow non-ruling firm-years of our ATR firms to serve as control observations. With these criteria in place, we have a maximum total sample of 4,576 firm-year observations. However, in many specifications, data requirements result in smaller samples. When examining the likelihood of obtaining a ruling and ruling outcomes, we limit the analysis to one ruling per firm-year. When analyzing the attributes of the rulings we allow multiple observations per firm-year in the handful of cases where a firm obtained multiple rulings. Nearly all of these rulings have different content, often representing different business segments.

4.3. Likelihood of obtaining a ruling

¹⁵ Additionally, Lisowsky (2010) point outs that matching *a priori* is inconsistent with the goal of determining which explanatory variables best describes the activity being studied.

¹⁶ The requirement to have at least \$150 million in assets and a Big 4 auditor is based on the lowest asset value among ruling firms and nearly all these firms have a Big 4 auditor.

To examine the likelihood of obtaining an advanced tax ruling, we start with a parsimonious list of explanatory variables in the spirit of Wilson (2009). We attempt to minimize sample attrition and use variables that are well established in the tax literature. Accordingly, we begin by using book-tax differences (*BTD*), book leverage (*Leverage*), the natural logarithm of total assets (*Size*), and return on assets (*ROA*) as our starting point for financial firms. We also include research and development (*RD*) for industrial firms. As R&D is rare in financials, we do not include it as a determinant for our financial firms. We also supplement this baseline determinants model with an additional specification with tax expense over total assets to replace book-tax differences, the ratio of foreign to total income (*Income_Ratio*), and total accruals (*Accruals*). Unless specified, we winsorize continuous variables at the 1st and 99th percentiles. Including *Income_Ratio* results in the loss of several ruling firms. Due to a lack of repeat observations, we do not cluster standard errors but use standard errors that are robust to heteroscedasticity.¹⁷ For this analysis, we partition the sample between industrials and financials but do not include year or industry fixed effects. While 2009 is overrepresented, it is likely due to our specific leak sample and not the broader tax ruling process. Accordingly, including fixed effects would be less than appropriate. For brevity, we only display the baseline logit equation:

$$Pr(ATR_{it} = 1) = \beta_0 + \beta_1 BTD_{it} + \beta_2 Leverage_{it} + \beta_3 Size_{it} + \beta_4 ROA_{it} + \beta_5 RD_{it} + \varepsilon. \quad (1)$$

We present the results of this analysis in Table 5. The determinants for receiving an ATR differ between financial and industrial firms. For financial firms, we find that the two key determinants are *Size* (0.5638, $t = 5.12$ in Column (1); 0.7164, $t = 3.85$ in Column (2)) and *Leverage* (-2.1702, $t = -2.70$ in Column (1); -2.3235, $t = -1.90$ in Column (2)). This is consistent with prior literature that larger firms can gain economies of scale with their tax

¹⁷ A single treatment firm has a ruling in three years and another has a ruling in four years. All other ruling firms at most have two observations in the sample.

planning (Rego 2003) and that there is a substitution effect between debt and non-debt tax shields (Graham and Tucker 2006; Li and Ma 2019). Thus, amongst financial firms, larger firms with lower levels of leverage and performance are more likely to receive an ATR. For industrial firms, we find that size (*Size* 0.5608, $t = 7.49$ in Column (3); 0.5361, $t = 6.54$ in Column (4)), performance (*ROA* 4.4195, $t = 2.44$ in Column (4)), and a higher proportion of foreign income to total income *Income_Ratio* (0.3023, $t = 3.25$ in Column (4)) are positively associated with receiving an ATR. Accruals (*Accruals* -3.3175, $t = -1.67$ in Column (4)) are negatively associated with receiving an ATR. Thus, for industrial firms, larger MNEs with more foreign income are more likely to receive an ATR, consistent with a greater opportunity and incentive to reduce overseas taxes.

In untabulated analysis, we find that if we limit the determinants among financials to leverage and size and among industrials to size, ROA, and the ratio of foreign income, we obtain similar explanatory power with an area under the ROC curve for these specifications of 80 percent and 78 percent, respectively. Collectively, the fact that we do find several significant differences between the ATR firms and control firms provides some assurance that our control sample is not made entirely up of firms receiving ATRs of similar substance and magnitude as those in the PwC Luxembourg Leaks sample. Of course, we cannot completely rule out the possibility that there are firms in our control sample that are also receiving ATRs within Luxembourg or elsewhere.

4.4. ATR probability and market reaction

Nesbitt et al. (2017) find that the market reaction to leaked ATRs is positive and around 43 basis points in a three-day window, which they argue is due to the fact that the ATR eliminates the risk that the particular tax transaction in question will be overturned (at least in Luxembourg). We extend this finding and examine if market participants also react

favorably to firms with characteristics similar to those with ATRs leaked in the Luxembourg Leaks. In Table 5, we present the determinants of obtaining an ATR for both financial and industrial MNEs. We use these determinants to examine the market reaction to non-leaked firms on November 5, 2014, the first Luxembourg leaks date. To perform this analysis, we use point estimates from Equation (1), including *Income_Ratio* and *Accruals*, to create a proxy to capture the odds of receiving an ATR, $\text{Ln}(\text{ATR_Odds})$, separately for financial and industrial firms, as follows:

$$\text{Ln}(\text{ATR_Odds})_{\text{financial}} = (-9.79) + (-2.32)*\text{Leverage} + (0.72)*\text{Size} + (10.24)*\text{ROA} \\ + (0.33)*\text{Income_Ratio} + (6.02)*\text{Accruals} + (-68.41)*\text{TXT/AT},$$

or

$$\text{Ln}(\text{ATR_Odds})_{\text{industrial}} = (-9.55) + (0.78)*\text{Leverage} + (0.54)*\text{Size} + (4.42)*\text{ROA} \\ + (0.30)*\text{Income_Ratio} + (-2.03)*\text{RD} + (-3.32)*\text{Accruals} \\ + (3.38)*\text{TXT/AT}.$$

We estimate an $\text{Ln}(\text{ATR_Odds})$ for all firms with necessary data in 2009. We select 2009 as it represents the most prevalent year in the sample of leaked ATRs, and it requires the assumption that a reasonable investor can use historical data from the time of the rulings. We calculate market reaction using a three-day [-1, 1] cumulative abnormal return (CAR) with a single-factor market model and the value weighted market return from CRSP. For this analysis, we specifically exclude leaked firms and regress CARs on $\text{Ln}(\text{ATR_Odds})$. We find that the market reaction is increasing in the odds of obtaining an ATR (coefficient on $\text{Ln}(\text{ATR_Odds}) = 0.22$; $t = 2.24$).

Our result is consistent with a positive spill-over effect for firms that appear similar on several key dimensions as ATR firms. This finding further highlights how this exogenous event helped investors understand and price tax planning activities from MNEs, even for non-leaked but similar MNEs. Additionally, this result supports the findings of our

determinants model and suggests that investors are using a similar set of variables and parameters to identify firms that likely received ATRs.

4.5. Tax rulings and tax outcomes

We next examine how receiving an ATR influences tax outcomes. We first present a baseline specification on the association between the presence of an ATR and each tax outcome. We then examine how each ruling type (i.e., internal financing or non-internal financing), each ruling attribute (i.e., use of hybrids, non-income tax avoidance, or a composite score for the overall complexity of the ATR), and the interactions between ruling types and attributes influence tax outcomes. We examine three key tax planning outcomes: three-year GAAP effective tax rates (G_ETR3), unrecognized tax benefits (Log_UTB), and the standard deviation of future cash tax payments (STD_CETR). We choose these measures because each captures a distinct construct that we aim to evaluate. The first construct is a broad measure of a firm's overall tax avoidance strategies. We use three-year GAAP ETR centered on the year of ruling. Our second and third constructs are current tax uncertainty and future tax risk, which we proxy for using the natural logarithm of UTBs at year-end and the standard deviation of cash ETRs from years t to $t + 3$ (a four-year measure), respectively. Our model is specified as below:

$$Tax\ Outcome_{it} = \beta_0 + \beta_1 ATR_{it} + Controls_{it} + Year + Industry + \varepsilon_{it}. \quad (2)$$

We include the same non-tax controls as in Table 5. Note that when we exclude $Income_Ratio$, which is poorly populated, our results become stronger. We include total accruals in the specification with Log_UTB to control for financial reporting decisions and the standard deviation of cash flows for the tax risk specification to aid in isolating deviations in cash ETR that are not driven by deviations in operating cash flows. We use ordinary least squares to estimate this regression. For the G_ETR3 model we require the

sum of pretax income over the three-year period to be positive. Following prior literature, we winsorize G_ETR3 at zero and one. We include SIC1 and indicators for 2008 and 2010 to control for industry norms and year shocks to tax planning activities.

We present the results in Table 6. In terms of three-year GAAP ETR, the presence of an ATR (-0.0683, $t = -1.91$ in Column (1)) is associated with a lower tax burden for financial firms. The magnitude of the coefficient suggests that the presence of an ATR is associated with a 6.83 percentage point lower three-year GAAP ETR for financial firms with an ATR disclosed in the Luxembourg Leaks relative to control firms. While the coefficient on ATR is negative for industrials, it falls slightly outside of statistical significance. The point estimates from this analysis is generally consistent with other Luxembourg Leaks papers (Huesecken and Overesch 2015; Hardeck and Wittenstein 2018), enabling us to extend this stream of literature.

In addition, industrial firms with ATRs record a higher level of UTBs than industrial firms without ATRs (0.4397, $t = 2.96$ in Column (7)). The magnitude of the UTB effect is similar for financial firms. However, the coefficient is not statistically significant (0.4298, $t = 1.28$ in Column (6)), which may be due to the much smaller sample size of financial firms. Finally, neither industrial nor financial firms with ATRs appear to have more volatile future cash ETRs than their respective control groups, indicating that the tax savings generated from the ATR are persistent.

4.6. Ruling type, ruling attributes, and tax outcomes

Thus far, we have shown a descriptive analysis of the Luxembourg Leaks data and examined the determinants and the tax planning effects of obtaining rulings. We now use the richness of our dataset to extend the tax literature into the black box of tax planning. We perform two sets of analyses. The first examines how each ruling type and ruling

attribute alters tax planning outcomes. Next, we perform a comparative analysis where we examine how the association between an ATR and tax planning outcomes differs between the two types of rulings (i.e., internal financing versus non-internal financing) across the three attributes of rulings.

To examine the interactive effect of ruling types with ruling attributes we create summary measures of hybrid arrangements, non-income tax avoidance, and ATR complexity. For hybrid arrangements, we define the variable *Hybrid* as the sum of the number of hybrid entities and hybrid instruments present in a given tax ruling. Next, we create indicators if a firm attempts to minimize either withholding tax and/or net wealth tax through its ATR. The variable *Nonin_Tax* is the sum of these indicators and ranges from [0, 2]. We create a composite score that includes indicators for hybrid entities, hybrid instruments, withholding tax avoidance, net wealth tax avoidance, certainty over tax residence, use of a holding company, and an indicator if a firm is above the median “depth” in their organizational structure. This variable, *ATR_Score*, takes values from [0, 7]. This measure gauges the complexity of a firm’s tax planning through its ATRs.

For this analysis, we set missing ruling types and attributes to zero. This enables us to examine tax outcomes across different ruling specifications though it may induce some noises into our estimation. For some firms receiving ATRs it is probable that we are missing information because it is simply not included in their ATRs. This, however, should likely bias against our intended findings, to the extent these firms have similar tax outcomes as firms with ATRs that are detailed.

We first examine the two ruling types and the three ruling attributes separately in the following specifications (Equations (3) and (4)) with the same controls as earlier. We then examine their interactive effects (Equation (5)). We estimate the following regressions:

$$Tax\ Outcome_{it} = \beta_0 + \beta_1 ATR_Type_{it} + Controls_{it} + Year + Industry + \varepsilon_{it}, \quad (3)$$

$$Tax\ Outcome_{it} = \beta_0 + \beta_1 ATR_Attributes_{it} + Controls_{it} + Year + Industry + \varepsilon_{it}, \quad (4)$$

$$Tax\ Outcome_{it} = \beta_0 + \beta_1 ATR_Type_{it} * ATR_Attributes_{it} + Controls_{it} + Year + Industry + \varepsilon_{it}, \quad (5)$$

where *ATR_Type* is either internal financing or non-internal financing and *ATR_Attributes* is either *Hybrid*, *Noninc_tax*, or *ATR_Score*.

In Panel A of Table 7, we present the results for estimating Equations (3) and (4) for three-year GAAP ETR. For financial firms, we find that the use of hybrid instruments and hybrid entities (*Hybrid*: -0.027, $t = -3.36$ in Column (1)) leads to significantly lower three-year GAAP ETR. In terms of economic significance, each hybrid instrument or entity leads to a reduction in three-year GAAP ETR of 2.7 percentage points. Non-income tax avoidance (*Noninc_Tax*: -0.047, $t = -2.90$ in Column (2); -0.023, $t = -2.21$ in Column (7)) leads to a significant reduction in three-year GAAP ETR for both financial and industrial firms. As the complexity of an ATR, proxied by *ATR_Score* (-0.021, $t = -2.82$ in Column (3); -0.008, $t = -2.54$ in Column (8)), increases, both financial and industrial firms realize lower three-year GAAP ETR. Finally, for financial firms, only ATRs dealing with internal financing (*Internal_fin*: -0.073, $t = -2.55$ in Column (5)) result in reduced three-year GAAP ETRs. For industrial firms, both internal financing (*Internal_fin*: -0.049, $t = -2.49$ in Column (9)) and non-internal financing (*Non_internal_fin*: -0.067, $t = -2.84$ in Column (10)) ATRs result in reduced ETRs.

Panel B of Table 7 presents the results for estimating Equations (3) and (4) with *Log_UTB* as the tax outcome variable. Our results indicate that for financial firms, the use of hybrid instruments and entities leads to higher UTBs (*Hybrid*: 0.0968, $t = 3.90$ in Column (1)). Thus, while an ATR is providing certainty in Luxembourg as to how the hybrid entity/instrument will be treated, it potentially gives rise to uncertainty in other taxing jurisdictions. For industrial firms, non-income tax avoidance is positively and

significantly associated with *Log_UTB* (*Noninc_Tax*: 0.1641, $t = 2.04$) in Column (7)). For both industrial and financial firms the complexity of an ATR as proxied by the ATR score (*ATR_Score*: 0.1390, $t = 1.84$ in Column (3); 0.0591, $t = 2.39$ in Column (8)), and receiving an ATR regarding a transaction that is not related to internal financing (*Non_internal_fin*: 0.6891, $t = 3.59$ in Column (5); 0.5044, $t = 1.99$ in Column (10)) are positively and significantly associated with UTB.

In Panel C of Table 7, we present the results of estimating Equations (3) and (4) with the standard deviation of cash ETR, our proxy for tax risk. For financial firms, there is little evidence of different ATR attributes influencing the standard deviation of cash ETR, indicating that the cash tax savings generated by the ATR are relatively persistent. However, for industrial firms, both the use of hybrids (*Hybrid*: -0.0236, $t = -1.99$ in Column (6)) and non-internal financing ATRs (*Non_internal_fin*: -0.2578, $t = -3.87$ in Column (10)) are associated with reductions in the standard deviation of future cash ETR. Thus, industrial firms seem to be able to use certain types of ATRs to generate more persistent cash tax flows.

Next, we estimate Equation (5). For each tax outcome variable, we compare the effect of internal financing versus non-internal financing ATRs. We then interact *Internal_fin* or *Non_internal_fin* with each ATR attribute examined in Table 7 (i.e., *Hybrid*, *Noninc_Tax*, and *ATR_Score*) to determine if there are any interactive effects.

In Panel A of Table 8, we report the results of estimating Equation (5) for three-year GAAP ETR. The downward effect of ATRs on three-year GAAP ETR appears to be concentrated in internal financing ATRs (*Internal_fin*: -0.0725, $t = -2.55$ in Column (1)) for financials and non-internal financing ATRs (*Non_internal_fin*: -0.0584, $t = -2.57$ in Column (5)) for industrials. For financial firms, there is an incremental downward effect when an

internal financing ATR is coupled with higher usage of hybrid instruments and entities (*Hybrid*Internal_fin*: -0.0178, $t = -2.53$ in Column (2)), consistent with hybrids being an important vehicle through which taxes are saved in internal financing transactions. For industrial firms, the negative association between non-internal financing ATRs and three-year GAAP ETR appears to be concentrated among ATRs using hybrids (*Hybrid*Non_internal_fin*: -0.0188, $t = -3.13$ in Column (6)), although ATRs with higher ATR scores and non-income tax avoidance fall slightly outside of statistical significance.

Panel B of Table 8 reports our results for UTB. As a baseline, the association between ATRs and increased UTBs seems to be concentrated in financial firms receiving non-internal financing ATRs. However, once we add interactions for a variety of ATR attributes more nuanced results appear. First, among internal financing ATRs, financial firms record higher levels of UTBs as the use of hybrid instruments and entities increases and as the ATR score increases. Thus, as financial firms' ATRs become more complex and use more hybrids, the firms begin to trade-off increased certainty in Luxembourg with increased uncertainty in other taxing jurisdictions. Across all specifications non-internal financing ATRs are positively associated with UTBs; however, this average effect is mitigated in industrials using hybrid entities and instruments, avoiding non-income taxes, and with higher ATR scores.

Finally, Panel C of Table 8 reports the results of estimating Equation (5) with the standard deviation of cash ETR as the dependent variable. On average, in Column (1), ATR usage among financial firms does not appear to be associated with volatility of cash ETR. Among industrials, in Column (5), non-internal financing ATRs are associated with a lower volatility of cash ETR. When we add interactions for ATR attributes we observe that among internal financing ATRs that there is evidence of lower volatility of cash ETR among financial firms receiving ATRs that do not avoid non-income taxes and with lower ATR

scores. For non-internal financing ATRs, both financials and industrials realize lower volatility of cash ETRs for ATRs that do not make use of hybrids; however, the effect is mitigated if hybrids are used in financial firms. In addition, industrials with non-internal financing ATRs that do not avoid non-income taxes and with low ATR scores realize lower volatility of cash ETRs. Thus, it appears that the less complex the ATR is, the lower the volatility of future cash ETRs.

We summarize the overall results in Table 8 as follows. It appears that the use of hybrid entities is a key driver of lower GAAP ETRs; however, this result differs in the type of transactions between financial and industrial firms. Second, we conclude that ATRs not pertaining to internal financing and reorganizations increase the uncertainty of a firm's tax positions. Finally, despite ATR firms in many instances increasing their UTB balances, we see no evidence that these highly structured tax planning transactions increase future tax risk.

5. Conclusion

We make use of leaked details of advanced tax rulings provided by the Luxembourg Tax Inspector to multinational firms. In these rulings, firms provide details of transactions and their intended tax treatments to the Luxembourg Tax Inspector for approval. Once approved, firms have the assurance as to how Luxembourg will treat these transactions for tax purposes. We create a hand-collected dataset by reading through a subset of these rulings that were leaked to the International Consortium of Investigative Journalists to garner information on transactions being used by MNEs to avoid tax.

Overall, this exploratory analysis reveals that these transactions are large in nature, averaging approximately \$2 billion per transaction. The majority of these transactions are designed to minimize the tax consequences of internal financing and reorganizations. As

such, many of the rulings involve the use of hybrid instruments and entities and make use of complex webs of subsidiaries, commonly located in tax havens. We observe that ATR firms realize lower GAAP ETRs and higher UTBs relative to control firms. However, on average we do not find evidence of ATRs increasing the future volatility of cash ETRs.

When we further partition the ATR sample on various characteristics of the ATRs, more nuanced results emerge. In particular, we find that rulings associated with internal financing transactions among financial firms and non-internal financing transactions among industrial firms drive the tax avoidance results. These results are even stronger in the presence of hybrid arrangements. Next, in all specifications, non-internal financing transactions result in higher uncertainty. Finally, we do not find evidence that ruling attributes increase future tax risk. In tandem with the UTB analysis, this provides some additional evidence on the conservative nature of the reporting requirements in FIN48 (Robinson et al. 2016; Gleason et al. 2018).

Our findings contribute to the literature on tax avoidance of multinationals by providing a unique look into the details of transactions that facilitate tax avoidance. Even though the ATRs that we examine are at least legal in Luxembourg, they can potentially point to other forms of tax avoidance. As the U.S., EU, OECD, and many other countries continue to develop ways of combatting base erosion, the results of our paper can provide taxing authorities with insight into transactions used by MNEs to move income through organizations and enable them to possibly devise means of curbing international tax planning.

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Appendix A: Variable Definitions

Variable	Description
Uses Hybrid Debt	Indicator variable set to one if the ruling contained one of the following hybrid instrument types: profit participating loans (PPLs), interest free loans (IFLs), mandatory redeemable preferred shares (MRPS), convertible preferred equity certificates (CPEC or PEC), or specifically stated the purpose of the ruling was on hybrid debt.
Number of Hybrid Notes	The number of specific hybrid instruments used. If multiple items exist for the same instrument type and are specifically listed out (i.e., “PPL1” and “PPL2”), we count these separately.
Largest Intercompany Note	Found in the transaction details or in the organizational chart. If not in USD, then converted to USD based on the exchange rate on the document stamp date.
Number of Notes	Number of intercompany loans in place at time of transaction. Often found in the company information or in the organizational chart. If none listed or provided, left blank.
# of Notes in Transaction	Number of intercompany loans as part of the transaction. Often found in the company information or in the organizational chart. If none listed or provided, left blank.
Partnership Split	The greatest split in partnership ownership percentages (i.e., 0.01% and 99.99% would be displayed as 99.99). Found in the organizational chart; if no partnerships or no percentages given, left blank
# of Hybrid Entities	Number of entities that appear to be a disregarded entity, a hybrid partnership, or a reverse hybrid partnership. Found in the company organizational chart (post-transaction, if multiple organizational charts are provided for different stages)
# of Subs Below Holdco	Number of disregarded entities below a single holding company. Found in the company organizational chart (post-transaction, if multiple organizational charts are provided for different stages)
Structure Depth	The number of tiers of direct ownership starting from the top parent down to the bottom subsidiary. Found in the company organizational chart (post-transaction, if multiple organizational charts are provided for different stages). We add one for a missing parent, if applicable. Left blank when no organizational chart is provided.
Internal Financing and Reorgs	An indicator variable set to one if the purpose of the transaction is internal financing and reorganization.
Investment and Divestitures	An indicator variable set to one if the purpose of the transaction is to make an investment, an M&A deal, post-merger integration, divestitures, spin-offs, and other similar transaction.
Tax Certainty	An indicator variable set to one if the purpose of the transaction is to gain certainty around a certain attribute, implementation of tax law, or changing a prior ruling. Example include certainty on permanent establishments, currency, and tax residence.
Intangible property	An indicator variable set to one if the general purpose of transaction relates to royalties, valuation of intangibles, or the location of intangible property.
# of Steps in Transaction	Identified if step numbers were clearly listed out. If no specific “steps” section was included, this was left blank.
Net Wealth Tax	Indicator variable set to one if a company avoids the Luxembourg Net Wealth Tax. Based on a basic document search for “net wealth tax” and whether or not the ruling discusses that the company’s new or proposed transaction/structure is exempt from net wealth tax.
# of Newly Formed Subs	Number found in either the detailed transaction steps or by comparing the existing and proposed organizational charts.
Functional currency of holding company	Based on a document search for explicitly stated “functional currency.” Left blank if none stated.
FX Hedging	Indicator set to one if the ruling explicitly mentioned that currency hedging is a factor. Search document for keywords (hedge, hedging, foreign currency,

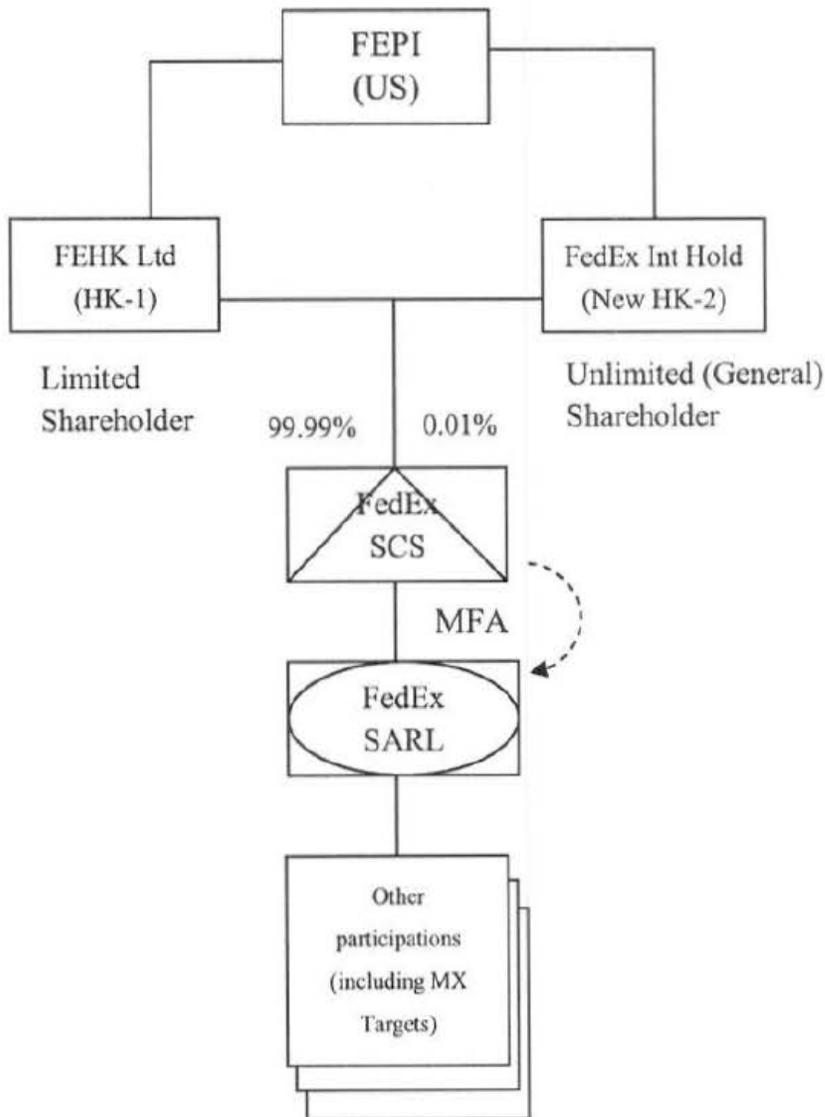
	exchange) to identify relevant sections.
Thin Capitalization	Indicator variable set to one if a basic document search contains key words (e.g., thinly capitalized, debt-to-equity ratio) and whether or not this was acknowledged in the planning process of the transaction.
Tax residence question	Indicator variable set to one if ruling addresses tax residence, with the majority of rulings trying establish tax residency in Luxembourg.
Cross-country ownership	Indicator variable set to one if there is a cross-country ownership link. Details found in transaction steps and/or the organizational chart
Withholding Taxes	Indicator variable set to one if ruling contains provisions aimed at avoidance of withholding taxes. Based on a basic document search for “withholding tax” and whether or not the ruling discusses that the company’s new or proposed transaction/structure is exempt from withholding tax.
Value of Transaction	Either the overall value explicitly stated value in ruling, often times located on the cover page of the memo or the largest transaction steps
Countries in transaction	Indicator variable set to one if an affiliate from the country is present in the transaction steps or org chart
G_ETR3	The sum of txt from t-1 to t+1 dividend by the sum of pi from t-1 to t+1)
Log_UTB	Natural log of year end unrecognized tax benefits (log(txtubend)).
STD_CETR	The standard deviation of cash ETR from year t to t+3, inclusive.
ATR	Indicator variable that equals one for the fiscal year a firm receives a tax ruling.
BTD	Pre-tax income minus taxable income scaled by total assets. Taxable income is defined as (txfd + txfo)/.35. If those values are missing it (txt - txdi-txo - txs)/.35 where txdi, txo, and txs are set to 0 for missing values.
Leverage	Total current and long term debt scaled by total assets (dlc+dltt)/at
Size	Nature log of total assets
ROA	Pretax income divided by total assets
Income_ratio	Foreign income dividend by pretax income (pifo/pi)
RD	Research and development expense divided by total assets. Missing values set to 0.
Accruals	Earning less cash flow scaled by total assets (PI - (OANCF - XIDOC - TXPD))/at
STD_CF	The standard deviation of operating cash flow from year t to t+3, inclusive.
ATR_Score	The sum of seven indicator variables for hybrid entities, hybrid instruments, withholding tax avoidance, net wealth tax avoidance, certainty over tax residence, use of a holding company, and an indicator if the firm organizational structure is more than 5 affiliates deep. Ranges from 0 to 7.
Hybrid	The sum of the number of hybrid entities and hybrid instruments.
Noninc_tax	Sum of indicator variables indicating whether a firm attempts to minimize withholding taxes and/or net wealth taxes. Ranges from 0 to 2.
Internal_fin	An indicator set to one if we categorize a ruling as “Internal Financing and Reorgs” defined above.
Non_internal_fin	An indicator set to one if we categorize a ruling as either: investment and divestitures, tax certainty or intangible property.

Appendix B: Luxembourg ATR Examples

Hybrid Arrangement Example

Fedex Corporation (2010 ruling; Figure B)

In this example, Fedex Corporation uses two hybrid entities located in Luxembourg and a master financing agreement (MFA) to allocate funds between these entities. Fedex SCS is considered a partnership for U.S. tax purposes (as denoted by the triangle) and a corporation for Luxembourg tax purposes (as denoted by the rectangle). Fedex SARL is considered a flow-through entity for U.S. tax purposes (as denoted by the circle) and a corporation for Luxembourg tax purposes. This example also highlights extreme partnership allocations of 99.99% and 0.01%.



Non-income tax avoidance examples

Coach Inc. (2009 ruling; pg. 4)

From Section B.5 Net wealth tax

“Once LuxCo engages in financing activities, it will contribute its financial assets to GibCo in exchange for shares. GibCo will thereafter transfer the receivables back to LuxCo against a EUR-denominated interest-free loan under a credit facility arrangement to be concluded between the two entities. Accordingly, LuxCo will be entitled to deduct the full amount of this credit facility from its unitary value for net wealth tax purposes.”

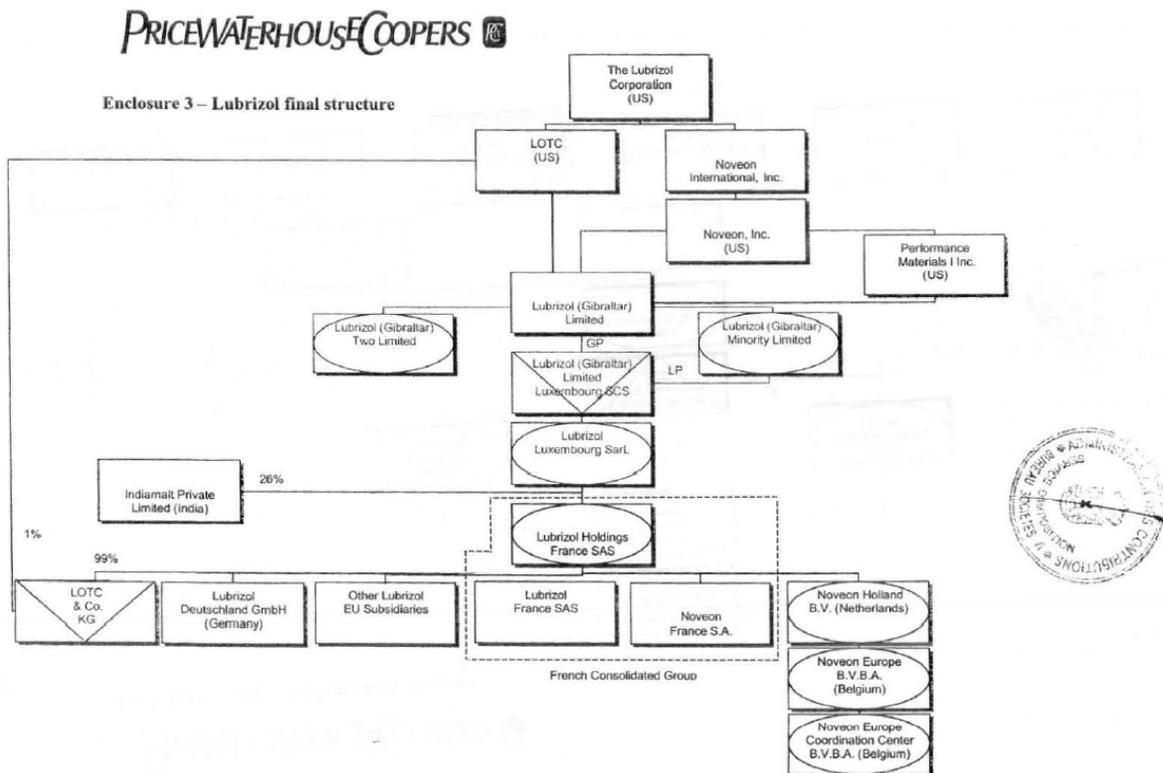
Citigroup (2009 ruling; pg. 4)

From B.2.2. Tax treatment of the double PPL structure

“No withholding tax (in the meaning of either article 146 (1) 2 LITL or of article 146 (1) 3 LITL) is due on interest paid under the PPLs 2.”

Example of “deep” organizational structure

Lubrizol (2009 ruling; Enclosure 3)



Example of internal financing transaction

Pepsi Bottling Group (2009 Ruling; A background)

2. In the framework of the Company's restructuring that took place during fiscal year 2008, PBG expanded its activities in the Russian market through the acquisition (via its joint venture with PepsiCo, Inc.) of the Russian company, JCS Lebedyansky (Russia's leading branded juice company).
3. As part of this acquisition, senior management of the Company decided to proceed to the reorganization and the refinancing of certain international subsidiaries of PBG. The steps and related organizational charts reflecting this reorganization (hereafter "Project First") are described in **Appendix 1**.

Example of non-internal financing transaction

Accenture (2010 Ruling; page 2)

B. Restructuring

5. The intellectual property portfolio of the group (the "IP") is currently held by the Swiss tax resident company Accenture Global Services GmbH ("AGS"). AGS is a subsidiary of Accenture Holdings GmbH ("AH"), also a Swiss resident company, which, in turn, is a direct subsidiary of Accenture SARL.
6. Accenture intends to transfer the IP from Switzerland to Ireland. It aims for the transfer of the IP to be effectively implemented on or around 31 August 2010.
7. The transfer of the IP should be executed through the following consecutive transactions:
 - AGS will transfer the IP to Accenture SARL for a value of approximately USD 1.2 bn., as agreed between the parties. This transfer will be done on or around 31 August 2010, in consideration for a USD denominated interest bearing loan.
 - The USD denominated interest bearing loan between Accenture SARL and AGS will be immediately allocated to the Swiss finance branch of Accenture SARL.
 - Subsequently, Accenture SARL will transfer the IP to its indirect Irish subsidiary, ("IrishCo"). The transfer will be carried out at the fair market value, estimated currently to be USD 7 bn., in consideration for equity and an interest bearing loan between Accenture SARL and IrishCo.
 - The interest bearing loan between Accenture SARL and IrishCo will be immediately allocated to the Swiss finance branch of Accenture SARL.

All transactions will be implemented either on the same day, or within two consecutive days.

Table 1: Sample Selection**Panel A: Reconciliation to Prior Literature**

Firms in Nesbitt, Outslay and Persson (2017)		82
Reduce		
	Firms whose rulings are not in English	(2)
	Private or not listed on U.S. exchange	(5)
Increase		
	U.S. listed companies merged, taken private, or liquidated prior to 2013	3
Final Number of Firms		78
Total number of Tax Rulings		141

Panel B: Countries of Incorporation and Rulings by Year

<u>Country</u>	<u>Frequency</u>	<u>Year</u>	<u>Frequency</u>
Bermuda	10	2003	1
Brazil	1	2004	1
Canada	6	2005	1
Cayman Islands	1	2006	3
China	1	2007	1
Germany	5	2008	10
Ireland	15	2009	82
Luxembourg	1	2010	42
Switzerland	4	<u>Total</u>	<u>141</u>
UK	11		
USA	86		
<u>Total</u>	<u>141</u>		

Notes: Panel A of Table 1 outlines our sample selection criteria. Panel B of Table 1 presents the frequency of country of incorporation and years for the ATRs in our sample.

Table 2: Sample Descriptive Statistics

Panel A: Details on Rulings (N = 141)

Label	N	Mean	Std Dev	25th Pctl	Median	75th Pctl
Transaction value (000s)	93	1,998,813	5,781,083	60,000	349,200	1,281,000
# of Countries in Ruling	141	2.86	1.89	2	3	4
# of Steps in Transaction	67	10.01	6.71	5	9	14
Number of Notes	98	2.41	3.44	1	2	3
# of Newly Formed Subs	119	1.48	1.99	0	1	2
Internal Financing and Reorgs	141	70%				
Investments and Divestitures	141	21%				
Tax Certainty	141	13%				
Intangible Property	141	9%				

Panel B: Details by Industry (SIC1)

Variable	SIC1=1	SIC1=2	SIC1=3	SIC1=4	SIC1=5	SIC1=6	SIC1=7
N	15	29	28	6	2	55	9
Mean Transaction Value (000s)	1,319,703	5,156,240	1,262,680	2,910,594	24,676	322,667	1,094,861
Median Transaction Value (000s)	401,102	1,983,340	500,000	1,281,000	24,676	79,026	78,953
% Reporting Transaction Value	80%	83%	57%	50%	50%	58%	78%
Internal Financing and Reorgs	67%	76%	71%	83%	50%	71%	44%
Investments and Divestitures	33%	21%	18%	0%	0%	23%	11%
Tax Certainty	13%	7%	14%	17%	50%	13%	22%
Intangible Property	0%	10%	14%	0%	50%	4%	22%

Panel C: Ruling Details (U.S. Incorporated vs. Non-U.S. Incorporated)

Label	<i>U.S. Incorporated</i>		<i>Non-U.S. Incorporated</i>	
	N	Mean	N	Mean
Total Rulings (N)	86		55	
Transaction value (000s)	56	2,012,038	37	1,978,796
# of Countries in Ruling	86	3.13	55	2.44
# of Steps in Transaction	40	10.25	27	9.67
Number of Notes	63	2.33	35	2.54
# of Newly Formed Subsidiaries	73	1.56	46	1.35
Internal Financing and Reorgs	86	66%	55	76%
Investments and Divestitures	86	21%	55	20%
Tax Certainty	86	14%	55	13%
Intangible Property	86	9%	55	7%

Notes: Table 2 presents descriptive statistics for the ATRs in our sample. Panel A presents the full sample descriptive statistics. Panel B presents the descriptive statistics by industry. Panel C presents the descriptive statistics separately for ATRs of U.S. incorporated firms and ATRs of non-U.S. incorporated firms. Variables are defined in Appendix A.

Table 3: Organizational Structure, Internal Financing, and Currency Descriptive Statistics

Panel A: Organizational Structure

Variable	N	Mean	Std Dev	25th Pctl.	Median	75th Pctl.
Partnership Split	28	90.33	17.93	90	99.85	99.940
# of Hybrid Entities	108	1.44	3.39	0	0.00	1
# of Subs Below Holdco	110	1.61	2.92	0	1.00	2
Structure Depth	122	6.54	2.50	5	6.00	8
Haven Subs	141	0.70	0.46	0	1.00	1
Incorporated in Haven	141	0.22	0.42	0	0.00	0

Panel B: Financing Attributes

Variable	N	Mean	Std Dev	25th Pctl.	Median	75th Pctl.
Uses Hybrid Debt (1/0)	133	0.56	0.50	0	1	1
# of Hybrid Notes	87	1.61	2.46	0	1	2
Largest Internal Note (000s)	58	2,460,142	6,856,931	55,880	358,530	1,569,830
# of Note in Transaction	98	2.41	3.44	1	2	3
Number of Notes	67	3.03	6.84	0	1	4
Thin Capitalization (1/0)	127	0.46	0.50	0	0	1
Withholding Taxes (1/0)	130	0.70	0.46	0	1	1
Tax Residence (1/0)	130	0.78	0.42	1	1	1
Net Wealth Tax (1/0)	128	0.65	0.48	0	1	1

Panel C: Currency at Holding Company and Hedging

Currency Used	<i>All Firms (N=101)</i>		<i>U.S. Incorporated (N=63)</i>		<i>Non-U.S. Incorporated (N=38)</i>		Notes: Table 3 presents descriptive
	N	%	N	%	N	%	
Euro	27	27%	20	32%	7	18%	ve
Pound Sterling	10	10%	6	10%	4	11%	
US Dollar	59	58%	33	52%	26	68%	
Other	5	5%	4	6%	1	3%	
FX Hedging (1/0)	129	5%	83	5%	49	6%	

statistics related to organizational structure (Panel A), financing attributes (Panel B), and functional currencies (Panel C) for the 141 ATRs in our sample. Variables are defined in Appendix A.

Table 4: Descriptive Statistics of Multivariate Test Variables**Panel A: Ruling Likelihood Analysis**

Financials						
Variable	N	Mean	Std. Dev.	25th Pctl.	Median	75th Pctl.
ATR	310	0.123	0.328	0.000	0.000	0.000
BTD	310	0.003	0.063	-0.010	0.005	0.027
Leverage	308	0.269	0.250	0.063	0.182	0.442
Size	310	9.350	2.230	7.437	9.000	10.782
ROA	310	0.037	0.095	0.004	0.023	0.057
Income_Ratio	290	0.368	0.938	0.012	0.180	0.525
Accruals	301	-0.006	0.089	-0.037	-0.005	0.023
TXT/AT	310	0.015	0.029	0.000	0.006	0.018
Industrials						
Variable	N	Mean	Std. Dev.	25th Pctl.	Median	75th Pctl.
ATR	4,144	0.015	0.123	0.000	0.000	0.000
BTD	4,144	-0.015	0.112	-0.029	0.009	0.039
Leverage	4,127	0.233	0.214	0.044	0.120	0.346
Size	4,144	7.523	1.569	6.287	7.369	8.522
ROA	4,144	0.038	0.138	-0.004	0.057	0.109
Income_Ratio	4,129	0.367	0.088	0.000	0.014	0.081
Accruals	4,020	-0.039	0.125	-0.080	-0.022	0.027
TXT/AT	4,144	0.019	0.031	0.003	0.016	0.033

Panel B: Tax Outcome Analysis

Variable	Financials			Industrials		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
G_ETR3	222	0.286	0.181	2,883	0.317	0.197
Log_UTB	217	3.529	2.138	3,094	2.808	2.047
STD_CETR	286	0.706	2.009	3,808	0.468	1.267
Internal_Fin	286	0.063	0.243	3,808	0.012	0.111
Non_Internal_Fin	286	0.045	0.209	3,808	0.007	0.085
Hybirds	286	0.016	1.249	3,808	0.037	0.557
Non_inc_tax	286	0.087	0.388	3,808	0.023	0.199
ATR_Score	286	0.311	1.072	3,808	0.068	0.576

Notes: Table 4 presents the descriptive statistics for the variables used in our multivariate tests. Panel A presents the determinants model descriptive statistics and Panel B presents the tax outcome model descriptive statistics. Variables are defined in Appendix A.

Table 5: Logistic Regression: Determinants of Obtaining an ATR

VARIABLES	<u>Financial Firms</u>		<u>Industrial Firms</u>	
	(1) Wilson Variables	(2) Aux Variables	(3) Wilson Variables	(4) Aux Variables
<i>BTD</i>	3.6308 (0.60)		2.3252 (0.74)	
<i>Leverage</i>	-2.1702*** (-2.70)	-2.3235* (-1.90)	0.5972 (0.89)	0.7772 (1.09)
<i>Size</i>	0.5638*** (5.12)	0.7164*** (3.85)	0.5608*** (7.49)	0.5361*** (6.54)
<i>ROA</i>	-7.2821* (-1.87)	10.2410 (0.99)	0.9777 (0.49)	4.4196** (2.44)
<i>Income_Ratio</i>		0.3251 (1.13)		0.3023*** (3.25)
<i>RD</i>			-2.3130 (-0.94)	-2.0252 (-0.76)
<i>Accruals</i>		6.0192 (0.75)		-3.3175* (-1.67)
<i>TXT/AT</i>		-68.4132 (-1.26)		3.3757 (0.48)
Constant	-7.0981*** (-5.89)	-9.7906*** (-4.86)	-8.9652*** (-11.59)	-9.5475*** (-11.04)
Observations	308	282	4,112	3,988
Fixed Effects	None	None	None	None
Cluster	None	None	None	None
ROC	0.813	0.881	0.771	0.786

Notes: Table 5 presents the results of estimating our determinants model. *, **, *** represent two-tailed significance at the 10%, 5%, and 1% levels, respectively. Variables are defined in Appendix A.

Table 6: Advanced Tax Ruling and Tax Planning Outcomes

VARIABLES	Financial Firms			Industrial Firms		
	(1) 3yr GAAP ETR Profitable Firms	(2) log UTB All firms	(3) STD CETR All firms	(4) 3yr GAAP ETR Profitable Firms	(5) log UTB All firms	(6) STD CETR All firms
<i>ATR</i>	-0.0683* (-1.91)	0.4298 (1.28)	-0.0859 (-0.23)	-0.0359 (-1.63)	0.4397*** (2.96)	-0.0289 (-0.19)
<i>Leverage</i>	0.0292 (0.68)	0.0949 (0.30)	0.0858 (0.32)	-0.0259 (-1.14)	-0.3028** (-2.46)	0.0331 (0.30)
<i>Size</i>	-0.0405*** (-6.62)	0.8673*** (25.99)	0.0031 (0.04)	-0.0027 (-1.05)	1.1217*** (70.40)	-0.0169 (-0.97)
<i>Roa</i>	-0.3122* (-1.92)	4.2898*** (3.39)	-2.1030** (-2.42)	-0.4618*** (-7.95)	0.9936*** (2.82)	-0.9750*** (-6.84)
<i>Income_ratio</i>	-0.0051 (-0.48)	0.2820*** (4.31)	0.7364*** (2.77)	-0.0111* (-1.95)	0.0454** (2.10)	0.0689 (1.50)
<i>Accruals</i>		-1.2224 (-0.95)			-1.3336*** (-3.52)	
<i>RD</i>				-0.5472*** (-8.83)	4.0408*** (14.48)	-0.7209*** (-2.98)
<i>STD_CF</i>			-0.0000 (-0.36)			-0.0000* (-1.65)
Constant	0.6895*** (9.97)	-4.8892*** (-14.99)	0.5319 (0.79)	0.4029*** (7.14)	-5.7413*** (-40.16)	0.3883*** (3.06)
Observations	217	208	277	2,865	3,082	3,788
R-squared	0.215	0.754	0.146	0.082	0.661	0.019
Fixed Effects	Year	Year	Year	SIC1 & Year	SIC1 & Year	SIC1 & Year

Notes: Table 6 presents the results of estimating our tax planning outcome model separately for financial and industrial firms. *, **, *** represent two-tailed significance at the 10%, 5%, and 1% levels, respectively. Variables are defined in Appendix A.

Table 7: The Effect of ATR Type and Attributes on Tax Outcomes

Panel A: Three-year GAAP ETR										
DV= G_ETR3	<u>Financial Firms</u>					<u>Industrial Firms</u>				
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Hybrid</i>	-0.027*** (-3.36)					-0.006 (-1.37)				
<i>Noninc_Tax</i>		-0.047*** (-2.90)					-0.023** (-2.21)			
<i>ATR_Score</i>			-0.021*** (-2.82)					-0.008** (-2.54)		
<i>Internal_fin</i>				-0.073** (-2.55)					-0.049** (-2.49)	
<i>Non_internal_fin</i>					-0.035 (-0.80)					-0.067*** (-2.84)
<i>Leverage</i>	0.034 (0.80)	0.031 (0.74)	0.028 (0.65)	0.037 (0.87)	0.030 (0.72)	-0.027 (-1.18)	-0.026 (-1.14)	-0.026 (-1.14)	-0.025 (-1.08)	-0.027 (-1.17)
<i>Size</i>	-0.042*** (-7.36)	-0.042*** (-7.16)	-0.041*** (-6.92)	-0.042*** (-7.29)	-0.041*** (-6.85)	-0.003 (-1.23)	-0.003 (-1.14)	-0.003 (-1.13)	-0.003 (-1.15)	-0.003 (-1.33)
<i>ROA</i>	-0.323** (-1.99)	-0.315* (-1.94)	-0.313* (-1.93)	-0.319* (-1.97)	-0.311* (-1.92)	-0.463*** (-7.99)	-0.462*** (-7.97)	-0.462*** (-7.97)	-0.462*** (-7.98)	-0.456*** (-7.85)
<i>Income_ratio</i>	-0.005 (-0.50)	-0.005 (-0.53)	-0.004 (-0.40)	-0.008 (-0.86)	-0.007 (-0.72)	-0.011** (-1.97)	-0.011** (-1.97)	-0.011** (-1.96)	-0.011* (-1.95)	
<i>RD</i>						-0.548*** (-8.93)	-0.546*** (-8.89)	-0.546*** (-8.88)	-0.544*** (-8.85)	-0.541*** (-8.75)
Constant	0.706*** (10.34)	0.698*** (10.23)	0.693*** (10.15)	0.702*** (10.33)	0.691*** (10.10)	0.406*** (7.20)	0.404*** (7.17)	0.404*** (7.16)	0.404*** (7.17)	0.405*** (7.21)
Observations	222	222	222	222	222	2,883	2,883	2,883	2,883	2,898
R-squared	0.227	0.228	0.231	0.223	0.228	0.082	0.082	0.082	0.083	0.079
Fixed Effects	Year	Year	Year	Year	Year	SIC1 & Year	SIC1 & Year	SIC1 & Year	SIC1 & Year	SIC1 & Year

Panel B: Log_UTB

DV=Log_UTB	<u>Financial Firms</u>					<u>Industrial Firms</u>				
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Hybrid</i>	0.0968*** (3.90)					0.0192 (1.01)				
<i>Noninc_Tax</i>		0.1724 (0.72)					0.1641** (2.04)			
<i>ATR_Score</i>			0.1390* (1.84)					0.0591** (2.39)		
<i>Internal_fin</i>				0.2897 (0.82)					0.2244 (1.58)	
<i>Non_internal_fin</i>					0.6891*** (3.59)					0.5044** (1.99)
<i>Leverage</i>	0.0277 (0.09)	0.0062 (0.02)	0.0803 (0.26)	0.0464 (0.15)	0.0399 (0.13)	-0.3098** (-2.52)	-0.3129** (-2.54)	-0.3131** (-2.54)	-0.3181*** (-2.58)	-0.3115** (-2.53)
<i>Size</i>	0.8796*** (28.35)	0.8824*** (28.75)	0.8649*** (27.68)	0.8784*** (26.99)	0.8806*** (28.52)	1.1270*** (71.13)	1.1248*** (70.70)	1.1246*** (70.72)	1.1249*** (70.93)	1.1256*** (70.77)
<i>ROA</i>	4.2140*** (3.32)	4.2109*** (3.32)	4.2547*** (3.34)	4.3387*** (3.45)	4.2299*** (3.32)	1.0352*** (2.94)	1.0288*** (2.92)	1.0291*** (2.92)	1.0329*** (2.93)	1.0339*** (2.93)
<i>Accruals</i>	-1.0692 (-0.83)	-1.1236 (-0.88)	-1.1711 (-0.91)	-1.2669 (-0.99)	-1.1597 (-0.90)	-1.3682*** (-3.61)	-1.3634*** (-3.59)	-1.3636*** (-3.60)	-1.3685*** (-3.61)	-1.3692*** (-3.61)
<i>RD</i>						4.0725*** (14.61)	4.0632*** (14.59)	4.0624*** (14.60)	4.0487*** (14.54)	4.0687*** (14.61)
<i>Income_ratio</i>	0.2935*** (5.33)	0.2904*** (4.93)	0.2763*** (4.71)	0.2849*** (4.98)	0.2952*** (5.17)	0.0471** (2.18)	0.0461** (2.13)	0.0461** (2.14)	0.0462** (2.14)	0.0463** (2.14)
Constant	-4.9469*** (-15.37)	-4.9493*** (-15.64)	-4.8581*** (-15.37)	-4.9696*** (-15.41)	-4.9554*** (-15.81)	-5.7784*** (-40.63)	-5.7629*** (-40.36)	-5.7619*** (-40.37)	-5.7629*** (-40.43)	-5.7693*** (-40.45)
Observations	217	217	217	217	217	3,094	3,094	3,094	3,094	3,094
R-squared	0.766	0.764	0.767	0.768	0.764	0.663	0.664	0.664	0.664	0.664
Fixed Effects	Year	Year	Year	Year	Year	SIC1 & Year	SIC1 & Year	SIC1 & Year	SIC1 & Year	SIC1 & Year

Panel C: Standard Deviation of Cash ETR

DV=STD_CETR		<u>Financial Firms</u>					<u>Industrial Firms</u>				
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
<i>Hybrid</i>	0.0576 (0.96)					-0.0236** (-1.99)					
<i>Noninc_Tax</i>		0.1884 (0.76)					-0.0442 (-0.65)				
<i>ATR_Score</i>			0.0585 (0.57)					-0.0269 (-1.52)			
<i>Internal_fin</i>				-0.1328 (-0.38)					0.0005 (0.00)		
<i>Non_internal_fin</i>					-0.0110 (-0.03)					-0.2578*** (-3.87)	
<i>Leverage</i>	0.1088 (0.40)	0.1131 (0.41)	0.1226 (0.45)	0.0859 (0.31)	0.0632 (0.23)	0.0316 (0.29)	0.0325 (0.30)	0.0333 (0.30)	0.0373 (0.34)	0.0314 (0.29)	
<i>Size</i>	-0.0069 (-0.09)	-0.0102 (-0.14)	-0.0101 (-0.14)	-0.0073 (-0.10)	-0.0053 (-0.07)	-0.0173 (-1.01)	-0.0173 (-1.00)	-0.0167 (-0.97)	-0.0170 (-1.00)	-0.0179 (-1.03)	
<i>ROA</i>	-2.1446** (-2.40)	-2.1619** (-2.41)	-2.1564** (-2.40)	-2.1723** (-2.42)	-2.1745** (-2.43)	-0.9778*** (-6.87)	-0.9771*** (-6.86)	-0.9764*** (-6.86)	-0.9767*** (-6.86)	-0.9781*** (-6.87)	
<i>STD_CF</i>	-0.0000 (-0.47)	-0.0000 (-0.46)	-0.0000 (-0.47)	-0.0000 (-0.35)	-0.0000 (-0.29)	-0.0000* (-1.69)	-0.0000* (-1.68)	-0.0000* (-1.69)	-0.0000 (-1.64)	-0.0000* (-1.67)	
<i>Income_ratio</i>	0.8277*** (3.38)	0.8223*** (3.37)	0.8226*** (3.36)	0.8326*** (3.36)	0.8349*** (3.37)	0.0694 (1.51)	0.0695 (1.51)	0.0696 (1.52)	0.0696 (1.52)	0.0692 (1.51)	
<i>RD</i>						-0.7215*** (-3.00)	-0.7195*** (-2.99)	-0.7178*** (-2.98)	-0.7154*** (-2.97)	-0.7215*** (-3.00)	
Constant	0.5913 (0.88)	0.6176 (0.92)	0.6094 (0.91)	0.6123 (0.91)	0.6097 (0.91)	0.3904*** (3.12)	0.3904*** (3.10)	0.3865*** (3.08)	0.3882*** (3.11)	0.3949*** (3.13)	
Observations	286	286	286	286	286	3,808	3,808	3,808	3,808	3,808	
R-squared	0.192	0.192	0.191	0.190	0.191	0.020	0.020	0.020	0.020	0.020	
Fixed Effects	Year	Year	Year	Year	Year	SIC1 & Year	SIC1 & Year	SIC1 & Year	SIC1 & Year	SIC1 & Year	

Notes: Table 7 presents the results of examining the effect of ATR types and ATR attributes on tax planning outcomes. *, **, *** represent two-tailed significance at the 10%, 5%, and 1% levels, respectively. Variables are defined in Appendix A.

Table 8: ATR Comparison Analysis

Panel A: Three-year GAAP ETR								
DV=G_ETR3	<u>Financial Firms</u>				<u>Industrial Firms</u>			
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Internal_fin</i>	-0.0725** (-2.55)	-0.0558* (-1.76)	-0.0563 (-1.35)	-0.0262 (-0.59)	-0.0258 (-1.33)	-0.0213 (-0.88)	-0.0070 (-0.20)	0.0135 (0.24)
<i>Hybrid * Internal_fin</i>		-0.0178** (-2.53)				0.0013 (0.36)		
<i>Noninc_Tax * Internal_fin</i>			-0.0148 (-0.70)				-0.0099 (-0.56)	
<i>ATR_score * Internal_fin</i>				-0.0128 (-1.17)				-0.0080 (-0.79)
<i>Non_internal_fin</i>	-0.0354 (-0.79)	-0.0313 (-0.59)	-0.0370 (-0.64)	-0.0273 (-0.27)	-0.0584** (-2.57)	-0.0332 (-1.50)	-0.0163 (-0.60)	-0.0138 (-0.44)
<i>Hybrid * Non_internal_fin</i>		-0.0110 (-0.52)				-0.0188*** (-3.13)		
<i>Noninc_Tax* Non_internal_fin</i>			0.0081 (0.21)				-0.0382 (-1.56)	
<i>ATR_Score * Non_internal_fin</i>				-0.0023 (-0.08)				-0.0131 (-1.51)
Observations	222	222	222	222	2,883	2,883	2,883	2,883
R-squared	0.229	0.231	0.230	0.230	0.083	0.083	0.083	0.083
Fixed Effects	Year	Year	Year	Year	SIC1 & Year	SIC1 & Year	SIC1 & Year	SIC1 & Year
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Log_UTB

Dv=Log_UTB	<u>Financial Firms</u>				<u>Industrial Firms</u>			
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Internal_fin</i>	0.2336 (0.67)	-0.0178 (-0.05)	0.1815 (0.49)	-0.8042** (-2.38)	0.1256 (0.81)	0.1578 (0.77)	0.0193 (0.04)	-0.4706 (-0.87)
<i>Hybrid * Internal_fin</i>		0.1044*** (3.86)				0.0058 (0.21)		
<i>Noninc_Tax * Internal_fin</i>			0.0471 (0.12)				0.1383 (0.55)	
<i>ATR_score * Internal_fin</i>				0.2878*** (2.80)				0.1510 (1.52)
<i>Non_internal_fin</i>	0.6689*** (3.44)	0.8237*** (3.49)	0.6803** (2.51)	0.9319** (2.13)	0.4483* (1.68)	0.6830** (2.06)	1.5238*** (4.14)	1.6349*** (4.72)
<i>Hybrid * Non_internal_fin</i>		-0.1285 (-0.98)				-0.1009* (-1.78)		
<i>Noninc_Tax* Non_internal_fin</i>			-0.0037 (-0.02)				-0.9216*** (-3.77)	
<i>ATR_Score * Non_internal_fin</i>				-0.0741 (-0.59)				-0.3430*** (-4.57)
Observations	217	217	217	217	3,094	3,094	3,094	3,094
R-squared	0.768	0.7719	0.768	0.771	0.664	0.664	0.665	0.665
Fixed Effects	Year	Year	Year	Year	SIC1 & Year	SIC1 & Year	SIC1 & Year	SIC1 & Year
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Standard Deviation of Cash ETR

DV= STD_CETR	Financial Firms				Industrial Firms			
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Internal_fin</i>	-0.1340 (-0.37)	0.0613 (0.16)	-0.4886** (-2.05)	-0.7605* (-1.97)	0.0469 (0.30)	0.1262 (0.65)	0.1400 (0.47)	0.5152 (1.08)
<i>Hybrid * Internal_fin</i>		0.0151 (0.70)				-0.0278 (-1.36)		
<i>Noninc_Tax * Internal_fin</i>			0.3042 (0.98)				-0.0545 (-0.36)	
<i>ATR_score * Internal_fin</i>				0.1624 (0.91)				-0.1056 (-1.30)
<i>Non_internal_fin</i>	0.0096 (0.02)	-0.6592*** (-3.19)	-0.0621 (-0.21)	-0.6075 (-1.51)	-0.2715*** (-3.66)	-0.2533*** (-3.28)	-0.1582 (-1.46)	-0.2265* (-1.86)
<i>Hybrid * Non_internal_fin</i>		1.1088*** (2.86)				-0.0082 (-0.42)		
<i>Noninc_Tax* Non_internal_fin</i>			0.1802 (0.54)				-0.1064 (-1.23)	
<i>ATR_Score * Non_internal_fin</i>				0.2354 (0.92)				-0.0074 (-0.24)
Observations	286	286	286	286	3,808	3,808	3,808	3,808
R-squared	0.191	0.207	0.192	0.193	0.020	0.020	0.020	0.020
Fixed Effects	Year	Year	Year	Year	SIC1 & Year	SIC1 & Year	SIC1 & Year	SIC1 & Year
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Table 8 presents the results of examining interactive effects between ATR types and ATR attributes on tax planning outcomes. *, **, *** represent two-tailed significance at the 10%, 5%, and 1% levels, respectively. Variables are defined in Appendix A.