

Transparency and Tax Evasion: Evidence from the Foreign Account Tax Compliance Act (FATCA)

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Abstract

We examine how increased reporting requirements for U.S. individuals with offshore assets affect the location of hidden investment assets. Specifically, we study the Foreign Account Tax Compliance Act (FATCA). FATCA requires foreign financial institutions to provide information to the U.S. government regarding U.S. account holders for the purpose of reducing offshore tax evasion. Using annual country-level data on investments in U.S. securities by foreign account holders from 2006 to 2015, we document a significant decrease in foreign portfolio investment to the U.S. from tax haven countries after signing on to FATCA, consistent with a decrease in “round-tripping” investment activity attributable to U.S. investors’ offshore tax evasion activities. However, we also find weak evidence of an increase in the amount of investment out of tax haven countries that did not agree to exchange information. These results suggest that some U.S. investors with hidden offshore assets moved assets to other countries that provide secrecy, thus enabling these investors to continue to evade U.S. tax liabilities. Our study contributes to both the academic literature on tax evasion as well as the analysis of similar yet controversial regulation being contemplated by numerous countries around the world.

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1. Introduction

Many recent academic papers and press articles examine how individuals and corporations reduce and avoid tax payments. U.S. multinational companies report effective tax rates much lower than statutory tax rates (Dyreng et al. 2017); these low rates are often achieved through legal avoidance techniques such as locating operations in or shifting income to lower-tax jurisdictions (Drucker 2010; De Simone, Klassen, and Seidman 2016) or, in extreme cases, through leaving the U.S. by merging with or being acquired by a foreign company (Jopson 2014; Kleinbard 2014). Although some individuals also choose the extreme (but legal) measure of expatriating to escape U.S. tax obligations (Economist 2016), other individual taxpayers evade U.S. tax burdens by hiding income or assets in low-taxed foreign countries (Zucman 2013b; Johannesen 2014; Johannesen and Zucman 2014; Hanlon, Maydew, and Thornock 2015; Omartian 2017). To address declining tax revenues attributable to such evasion, the U.S. implemented policies that increase the reporting requirements for taxpayers with offshore assets. This paper studies how these increased reporting requirements affect the location of investment assets.

In 2010, the U.S. government passed the Foreign Account Tax and Compliance Act (FATCA).¹ The purpose of FATCA is to limit the ability of U.S. persons to keep assets hidden offshore, beyond the reach of the U.S. taxing authority, by requiring automatic information transfers about foreign investments and related cross-border payments.² In contrast to the previous reporting regime under which a U.S. person self-reported such information to the taxing authority, FATCA requires that foreign financial institutions (FFIs) such as foreign banks directly remit

¹ FATCA was part of the Hiring Incentives to Restore Employment (HIRE) Act of 2010. The acronym was intended to resemble the colloquial term “fat cats” as a reference to cracking down on wealthy individuals (Sheppard 2009). We provide detailed information on FATCA in Section 2.

² A U.S. person is defined as a citizen or resident of the U.S., a domestic partnership, a domestic corporation, any estate other than a foreign estate, or any trust under the control of U.S. persons ([https:// www.irs.gov/individuals/international-taxpayers/classification-of-taxpayers-for-u-s-tax-purposes](https://www.irs.gov/individuals/international-taxpayers/classification-of-taxpayers-for-u-s-tax-purposes)).

information about their clients to the IRS. Furthermore, the implementation of FATCA is far-reaching and compulsory, affecting most foreign governments and FFIs. As such, the passage of FATCA is a significant change to the tax reporting environments of U.S. taxpayers and worldwide financial institutions.

Our main research question is whether and to what extent FATCA has affected the location of foreign investment assets held by U.S. individual investors, some of which may be held offshore to evade taxes. The theory of tax evasion suggests that tax compliance is increasing in detection risk (Allingham and Sandmo 1972). The dramatic shift from a self-reporting regime to automatic reporting by a third party under FATCA, if effectively implemented, substantially increases the probability of detection and theoretically should lead to a lower level of U.S. offshore tax evasion (Dharmapala 2016). Concurrent work examining incorporations of offshore entities to facilitate tax evasion provides empirical evidence consistent with this prediction, finding a significant reduction in the number of shell company incorporations in tax havens following FATCA (Omartian 2017).

However, theory also predicts that evasion will continue as long as it is expected to be profitable to the individual. Thus, we may instead observe that offshore tax evasion by U.S. citizens continues post-FATCA if the cost of relocating assets to non-FATCA-signing jurisdictions or shifting to alternative asset classes is lower than the taxes and penalties due upon revealing hidden assets. Consistent with this prediction, Langenmayr (2015) finds that the amount of offshore tax evasion increased after the U.S. initiated an amnesty program in 2009 targeted at U.S. taxpayers with offshore accounts, which may be attributable to both the net personal benefits of retaining income offshore (as opposed to paying historical tax liabilities), as well as different risk preferences exhibited by these high wealth individuals (Slemrod, Blumenthal, and Christian 2001;

Alstadsaeter, Johannesen, and Zucman 2017). Further, opportunities for tax evasion may continue to exist due to an ineffective regulation and/or partial implementation of FATCA. Several studies examining the enactment of earlier information exchange agreements and changes to European automatic reporting regimes find little reduction in the overall level of offshore evasion after the regulation changes. Instead, this literature shows that taxpayers simply move hidden assets to jurisdictions not covered by the regulation (Caruana-Galizia and Caruana-Galizia 2016; Huizinga and Nicodème 2004; Johannesen 2014; Johannesen and Zucman 2014; and Omartian 2017). Therefore, whether and to what extent the FATCA reporting regime has affected offshore tax evasion by U.S. individuals (via relocation of foreign investment assets) is an open question.

Because data directly measuring the amount and location of U.S. citizens' offshore assets are unavailable, we extend the research design in Hanlon, Maydew, and Thornock (2015) that captures offshore tax evasion by studying how the location of inbound investment by individual investors to the U.S. ("foreign portfolio investment" or hereafter "FPI") changes following FATCA. The three inherent assumptions with this research design are: 1) investors exhibit a "home bias" such that they prefer to invest in their home country (French and Poterba 1991; Tesar and Werner 1995); 2) foreign investors should be unaffected by U.S. regulation; and 3) hidden offshore investment assets are primarily held in tax haven countries. Therefore, changes in inbound investment from tax haven countries following a U.S. regulatory change can be attributed to changes in U.S. persons' hidden offshore investment activity. We examine whether the amount of inbound investment from tax havens changes after 2012, the year in which the U.S. issued definitive FATCA guidance and – most importantly – foreign countries agreed to the automatic exchange of account holder information. To do so, we use annual country-level data from 2006 to 2015 provided by the U.S. Treasury International Capital System (TIC), which aggregates

required securities holdings information from U.S. banks, financial institutions, broker/dealers, and custodians. We find that the amount of equity investment into the U.S. from FATCA-signing tax havens declined by 22.3 percent after 2012, consistent with U.S. investors moving assets out of FATCA-signing tax havens. These results are robust to inclusion of country fixed effects, year fixed effects, and country-level measures predictive of the amount of cross-border investment into the U.S. In additional tests, we find that the Bahamas, Panama, Singapore, and Switzerland exhibited the largest declines in inbound U.S. equity investments after FATCA.

Having documented changes in the origin of inbound FPI to the U.S. after 2012, we perform several additional tests to validate our main results. First, we examine changes in FPI after 2008, when a UBS whistleblower disclosed information about the Swiss bank facilitating foreign tax evasion by U.S. residents, as well as after 2010, the year the FATCA legislation was passed. We conduct these tests for two reasons. First, these tests serve as a falsification analysis to ensure that the main results we observe do not merely reflect differences in FATCA-signing haven countries' activities relative to other havens throughout the entire sample period. Second, these tests provide a comparison of the importance of the implementation of the FATCA reporting regime in 2012 relative to other significant offshore evasion events. We caveat that these tests are conducted during and immediately following the financial crisis, and any results should be interpreted with caution. Our tests show some reduction in inbound investment after 2008 but no reduction after 2010, which reinforces that our main result is the outcome of the FATCA reporting regime as opposed to other important and related events.

Our results suggest that FATCA had a real effect on the amount invested into the U.S. from haven jurisdictions that agreed to exchange information. However, while a large portion of U.S. persons' offshore hidden assets may be invested back into the U.S. (consistent with investors'

home bias), hidden offshore assets are likely also invested from haven jurisdictions into other countries as well. Therefore, we also test whether the amount of FPI investment out of FATCA-signing havens to many destination countries (not just the U.S.) changes after FATCA. To do so, we exploit cross-border fund holdings using worldwide data from the IMF Coordinated Portfolio Investment Surveys (CPIS). We use the data both as originally reported to the IMF and as adjusted following Zucman (2013a), which replaces unreported amounts with estimates. Similar to the Treasury data, the CPIS data provide information on cross-border investment holdings. However, the CPIS data are more comprehensive in that they include holdings for more than 70 countries, such that we can observe the amount of investment holdings between many countries (not just U.S.-foreign). We find a greater effect of FATCA once considering other destination locations: the total amount of FPI out of FATCA-signing havens declines by 23.7 to 30.7 percent after 2012. Falsification tests again confirm that this result does not exist in prior years, and results are robust to excluding 2014 and 2015, the years in which many countries agreed to a global reporting regime that may also affect worldwide cross-border investment.

As a third test, we construct an estimate of the amount of hidden assets in each country each year. Following Zucman (2013b), we calculate this amount by comparing the amount of foreign-owned investments in one country (as reported by that country to the IMF) to the aggregate amount of investment reported by investee countries.³ For example, we compare the amount of foreign-owned assets reported by Switzerland to the sum of the amounts that all other countries report is invested in Switzerland. A positive difference, or gap, is an estimate of the assets hidden within the country. We find that the estimated amount of hidden assets held in FATCA-signing havens declined 29 percent in the period since 2012. The collective evidence from all of these

³ We are grateful to Gabriel Zucman for posting his Stata code and data at <http://gabriel-zucman.eu/>.

tests is consistent with individuals responding to FATCA by withdrawing assets from FATCA-signing havens.

A natural question then is: where did the assets move to? Assets may have moved to other countries and/or be invested in alternative assets classes. To examine this question, we further use the CPIS data to test if the amount of FPI out of non-signing haven countries *increases*, as U.S. persons may simply move assets into other jurisdictions that have not signed an Intergovernmental Agreement (IGA) governing bi-lateral information exchange.⁴ We find mixed results. In general, we find a positive change in the amount of FPI out of non-signing haven countries after 2012, but the statistical significance of this effect varies across specifications, although many of these tests suffer from small sample size. When we relax the sample selection requirement of a full panel for each country included in estimation, we find a statistically significant increase in the amount of FPI out of non-signing haven countries after 2012. Furthermore, when we study all non-signing countries with available data (not just havens), we observe a statistically significant increase in the amount of FPI after 2012 as well.

We conclude that FATCA significantly altered the location of investment assets. After foreign countries agreed to the automatic exchange of information with U.S. taxing authorities, we find that some U.S. investment assets appear to move out of FATCA-signing tax havens, and weak evidence suggests that these assets shift to other countries that have not agreed to the exchange of information and that continue to provide a veil of secrecy that facilitates tax evasion. Given the increased attention on tax avoidance activities and greater worldwide information reporting standards, other countries (including the U.S.) may eventually agree to automatic information exchange. If this is the case, moving assets from country to country could be a short-term solution.

⁴ We intend to test changes in alternative investment classes, such as real estate and fine art, in future work.

However, the fact that investors are willing to incur the costs of moving assets – and incur these costs multiple times – suggests that the relative benefit of evading taxes on offshore income must significantly outweigh these costs.

Our study makes several contributions to the literature. First, we document how reporting requirements can induce important investment location effects.⁵ Understanding these effects is important because it is unclear that a change in reporting alone in this setting could have any real effect. Further, many countries are implementing international reporting requirements similar to FATCA.⁶ Our paper informs both the academic literature on how taxes and reporting requirements affect investment location decisions, as well as the global policy discussion related to tax evasion and cross-border information reporting.

Second, there is an active debate whether FATCA is an overreach of U.S. authority, with many comparing the high costs of compliance borne by FFIs to the relatively nominal governmental revenue estimates (Christians 2012). This paper offers evidence on the efficacy of this legislation by showing that, while some tax evasion via round-tripping declines following FATCA, at least some of that evasion shifts to other locations. We contribute to both the academic literature on tax evasion as well as the policy analysis of this regulation by showing that the effectiveness of the regulation is a function of the extent to which foreign countries participate in full information exchange to reduce or eliminate evasion opportunities. Third, we complement concurrent work by Johannesen et al. (2017), who document increased compliance following IRS

⁵ Our study is related to Hanlon, Maydew, and Thornock (2015) in that our first tests also examine the “round-tripping” tax avoidance behavior of U.S. persons. We extend their findings by 1) focusing on required information exchange (as opposed to round-tripping behavior response to tax rate changes or bilateral tax information exchange agreements where information is provided upon request) that affects many more countries, 2) employing tests of both U.S. specific round-tripping using TIC data as well as worldwide foreign investment activity using data from CPIS, and 3) focusing on the sample period 2006 through 2015. In so doing, we provide empirical evidence on this specific reporting regime.

⁶ The international reporting requirements for individuals and companies are outlined in the OECD Common Reporting Standards (CRS) and the OECD’s Base Erosion and Profit Shifting (BEPS) rules, respectively.

amnesty programs targeted at U.S. taxpayers with hidden offshore holdings. Our findings reaffirm that increased compliance and continued evasion are not mutually exclusive.

2. Institutional details

2.1 U.S. tax rules and pre-FATCA tax evasion

U.S. persons are taxed on their worldwide income, regardless of where the income is earned. In addition to reporting domestic income on the annual federal income tax return, U.S. persons also must report and pay taxes on foreign income, including any income earned on assets held in foreign investment accounts (i.e., interest, dividends, and gains).⁷ Income earned domestically is generally reported by financial institutions to the recipient and to the IRS to ensure that the income is included on the recipient's corresponding annual federal income tax return. However, before FATCA, there was little to no third-party reporting of foreign investment income; U.S. persons were responsible for both self-reporting the existence of foreign bank accounts as well as remitting U.S. tax due on income earned in these offshore accounts.

U.S. persons may have offshore accounts for a number of legitimate reasons.⁸ However, U.S. persons may also set up foreign accounts for the purposes of evading U.S. tax. In this case, it is unlikely that the U.S. person would comply with the requirements to self-report income to the U.S.⁹ If the account is opened in a foreign country that imposes little foreign tax on investment income, the U.S. person will earn income on the foreign assets virtually tax-free.

⁷ The U.S. provides a foreign tax credit that mitigates double taxation by reducing the amount of U.S. tax due by the amount of foreign taxes paid in other jurisdictions.

⁸ For example, a local bank account can make local transactions easier (e.g., direct deposit of salary for expatriates working abroad). Many U.S. businesses need foreign accounts to support business operations of foreign subsidiaries.

⁹ To avoid detection, assets are usually moved to a destination country with strong bank secrecy rights either by physically traveling with cash and/or through a series of small wire transfers to avoid reporting under the U.S. Bank Secrecy Act. Once deposited in an offshore account, the U.S. person can invest the assets in other countries, including the U.S., disguised as a foreign person. Income earned on the investments accrues to the foreign account.

To address offshore tax evasion concerns, the U.S. established a “Qualified Intermediary” (QI) program in 2001. Under this program, some FFIs (including foreign banks) registered with the U.S. government to collect and remit tax on U.S.-sourced income earned by their clients. Specifically, QIs are responsible for identifying the nationality of their customers to determine if a U.S. withholding tax liability might exist, withholding the appropriate U.S. tax, and remitting the tax and other information to the IRS.¹⁰ In exchange for serving as a taxing authority intermediary, FFIs were subject (pre-FATCA) to easier rules for determining withholding responsibilities of their foreign customers (Sheppard 2005).

Despite the U.S. requirements for reporting foreign accounts and the existence of the QI program, the estimated amount of unreported offshore income grew significantly from \$123 billion in 2001 (TIGTA 2009) to an annual average of \$458 billion for 2008 to 2010 (TIGTA 2012). The gap was in part attributable to the self-reporting nature of the filing requirements. Furthermore, while the QI program was intended to improve compliance and collection of U.S. taxes due on foreign investment income, the mechanics of the rules allowed U.S. persons to hide under the name of a foreign corporation established by the U.S. person.

The IRS offered an amnesty program in 2003 that permitted taxpayers who had underreported offshore income to remit unpaid taxes with reduced penalties.¹¹ Approximately 1,300 returns were filed under the amnesty, generating \$280 million of tax (Blum 2003) – a relatively small amount given the number of taxpayers estimated to have unreported offshore income. Further, assets continued to flow to offshore locations: in 2006, the IRS Commissioner

¹⁰ In this context, a withholding tax is a tax that is applied to U.S.-source income. If the amount withheld is greater than the amount due, the recipient can file a tax return to request a refund. For foreign individuals not subject to U.S. taxes, the amount of withholding may be reduced under a tax treaty.

¹¹ This amnesty program was specifically focused on taxpayers who had underreported taxable income by first depositing income offshore and then accessing the funds by using untraceable foreign debit cards (Laffie 2003).

reported to Congress that “offshore tax shelters are robbing the American treasury of billions of dollars each year” (Everson 2006).

2.2. *The UBS case and legislative history of FATCA*

The scrutiny of offshore income intensified in 2008 when Bradley Birkenfeld, a former UBS investment banker, provided information to U.S. taxing authorities about how UBS assisted a number of U.S. taxpayers to evade tax by opening offshore accounts. The Department of Justice entered into a deferred prosecution agreement with UBS, in which UBS paid a \$780 million fine to the U.S. government and disclosed information on 4,450 undeclared accounts of U.S. persons. Since 2008, the Department of Justice has prosecuted a number of other foreign banks and received over 300 whistle-blowing tips on offshore tax evasion (Schreiber 2013). The IRS has also sponsored three additional amnesty programs in which over 54,000 U.S. taxpayers have remitted more than \$8 billion to the government (IR-2016-17).

The UBS case highlighted the extent of offshore tax evasion, including problems with the self-reporting requirements for offshore income, as well as the QI program. In response, several legislators proposed bills in the fall of 2009 and winter of 2010 that would reduce the ability of U.S. persons to evade taxes through offshore structures. FATCA was passed in March 2010 as part of the Hiring Incentives to Restore Employment Act. The law was expected to raise \$8.5 to \$8.7 billion over 10 years.¹² While many acknowledged that FATCA should reduce the amount of offshore tax evasion, financial institutions, practitioners, and Americans living overseas criticized the law for the high costs of implementation, as well as the broad financial reach to every financial

¹² Details of the revenue estimate are not publicly available. It is not clear if expected revenue from FATCA relates to estimated withholding taxes or taxes collected on income that would have gone unreported absent FATCA. Treasury officials stated after the law was passed that the purpose was not actually to collect cross-border withholding taxes but rather to improve the reporting of foreign assets by U.S. taxpayers (Sapirie 2010; Coder 2011); thus, presumably the revenue estimate was related to improved reporting and tax compliance.

institution in the world.¹³ Many predicted that the law would result in a number of unintended consequences, including a spike in the number of U.S. citizens renouncing their citizenship to avoid historical and prospective compliance burdens,¹⁴ a reduction in the amount of capital invested in the U.S. as FFIs exited U.S. investment strategies that would otherwise trigger FATCA reporting requirements, and greater resistance on the part of foreign banks to accepting U.S. clients.

2.3. *Mechanics of FATCA*

Under FATCA, FFIs have three options: 1) comply with FATCA by entering into an FFI agreement with the IRS, 2) divest from U.S. securities so as to avoid any FATCA reporting and withholding taxes, or 3) incur a 30 percent withholding tax on any U.S.-sourced income (Parillo 2010). To comply, the FFI must register with the IRS, perform diligence on existing account holders to identify U.S. persons that directly or indirectly own accounts at the FFI, establish processes to identify U.S. persons when new accounts are opened, and provide information to the IRS about both U.S.-source and foreign-source payments received on behalf of U.S. account holders (Granwell 2009; Notice 2011-34; Michel and Rosenbloom 2011; and Parillo 2012). The first list of more than 77,000 registered FFIs was published in June 2014 (Sapirie 2014).¹⁵ A 30 percent withholding tax on all interest, dividends, and gross proceeds from sales of securities received from the U.S. was imposed on nonparticipating FFIs, noncompliant foreign entities, and recalcitrant holders beginning July 1, 2014 (Sapirie 2014), although no data are currently available on the amount, if any, of tax actually collected.

¹³ Attorneys Michel and Rosenbloom characterize FATCA as “the most extensive extraterritorial reach of U.S. tax enforcement in history” (2011). Analysis of the costs of FATCA is limited to survey evidence and anecdotal accounts. For example, half of the firms in one survey expected to spend less than \$250,000 on implementing FATCA; however, 20 percent of firms stated that compliance with FATCA would cost \$1-\$10 million, and four percent stated that they would spend over \$100 million to comply (Parillo 2013).

¹⁴ The number of U.S. citizens renouncing their citizenship in 2015 (4,281) is almost 15 times the number in 2006 (278), which some attribute to FATCA (Sapirie and Johnston 2013; Velarde 2016).

¹⁵ The list can be accessed for search and download at <https://apps.irs.gov/app/fatcaFfiList>. As of August 2017, the list includes over 290,000 entities.

Compliant FFIs directly report information to the IRS. Alternatively, a number of countries have signed Intergovernmental Agreements (IGAs), which outline FATCA compliance at the country-level. In the “Model 1 IGA,” FFIs report the requisite FATCA data to the FFI’s home country, which in turn transmits information to the IRS on the FFI’s behalf (McMahon 2012). Under the “Model 2 IGA,” the country agrees to support FATCA, but the FFI must individually transmit information to the IRS. As of 2017, 113 countries have agreed to information exchange by either signing a Model 1 or Model 2 IGA.¹⁶ International cooperation is due in part to the demand for the same information by local taxing authorities for enforcement purposes. Another reason is that some IGAs include provisions for the reciprocal exchange of information about the U.S. financial activity of non-residents. However, U.S. laws currently allow only for information reporting about non-resident interest earned in U.S. accounts.¹⁷

The change in reporting mandated by FATCA provides a unique setting to study offshore tax evasion and test how increased transparency affects individual investment location decisions.

3. Prior literature and hypothesis development

Whether and to what extent individuals engage in crime is a function of enforcement, particularly the cost of catching and convicting offenders, the nature of the punishment, and the subsequent responses of future offenders (Becker 1974). Focusing specifically on the crime of tax evasion, Allingham and Sandmo (1972) demonstrate that the optimal level of evasion depends on detection risk, the size of the tax penalty, and a taxpayer’s degree of risk aversion. These theories

¹⁶ The first Model 1 countries were France, Germany, Italy, Spain, and the UK, all of which announced their cooperation on February 8, 2012 (Sapirie, Coder, and Parillo 2012). The first two Model 2 countries were Switzerland and Japan (Coder 2012).

¹⁷ The lack of additional reciprocal information sharing earned the U.S. the distinction as the “third worst jurisdiction in the world for financial transparency” (Tax Justice Network 2015), following Switzerland (1st) and Hong Kong (2nd). Singapore, the Cayman Islands, and Luxembourg hold the 4th, 5th, and 6th places on the list, respectively.

predict that individuals will engage in tax evasion if the cash tax savings from underpaying or escaping taxation exceeds the costs incurred. A taxing jurisdiction directly influences the costs of evasion by setting penalties and allocating resources for enforcement.

Due to the unobservable nature of taxpayers' degree of risk aversion, the academic literature has primarily studied the effects of detection risk and penalties on tax evasion activities. Low governmental resources for tax administration often leads to detection risk and penalties being policy substitutes, with jurisdictions setting high penalties to compensate for a low likelihood of detection (Sandmo 2005). To increase detection, some governments require automatic reporting of income to the tax authority.¹⁸ The analytical and empirical literature demonstrates that compliance is "nearly perfect" for transactions subject to this type of reporting (Kaplow 1990; Klepper and Nagin 1989; Slemrod 2007; Alm, Deskins, and McKee 2009).

While automatic information reporting is optimal for compliance, direct observation of all income earned is costly (Kaplow 1990). Consequently, evasion often manifests in self-reported income, in which an individual is supposed to identify, quantify, and self-report amounts received to a taxing authority. For example, Klepper and Nagin (1989) examine U.S. income tax returns and find much higher levels of non-compliance for taxpayers with self-reported business income. In an experimental study of over 42,000 Danish taxpayers, Kleven et al. (2011) similarly find that the level of evasion is significantly higher for self-reported income. This study also randomly assigns taxpayers to groups notified of differing levels of audit probabilities (zero, 50, or 100 percent) and observes significant increases in the amount of self-reported income within the group of taxpayers with a definite (100 percent) audit probability, evidence that an increase in detection risk results in a reduction of tax-evasion on self-reported income.

¹⁸ Examples of this type of reporting include the completion and transmission of U.S. Forms W-2, 1099-INT, and 1099-DIV to the IRS to report an individual's wages, interest income, and dividend income, respectively.

Income earned on offshore assets is particularly susceptible to underreporting due to the un-observability of U.S. citizens' foreign income and the lack of automatic reporting in the pre-FATCA period. Even though the potential penalties from offshore tax evasion can be high, the lack of information reporting results in a relatively low rate of detection for a U.S. individual participating in offshore tax evasion activities. Consequently, a large amount of wealth is retained offshore, where it continues to earn additional untaxed investment income. Zucman (2013b) estimates that as much as eight percent of worldwide household financial wealth, or \$5.9 trillion, is held in tax havens. Specific to the U.S. and round-tripping activities by U.S. investors, Hanlon, Maydew, and Thornock (2015) estimate tax revenue loss of \$8 to \$27 billion on foreign assets moved offshore (and likely never declared to tax authorities), with an ongoing annual revenue loss of \$1 to \$2 billion on investment income earned on these offshore assets.

FATCA directly increases the likelihood of detection by converting from a self-reporting system for offshore investment income to automatic reporting. Dharmapala (2016) analytically demonstrates that FATCA increases the probability of detection, which in turn results in greater compliance by U.S. citizens and a lower level of U.S. offshore tax evasion. In a FATCA-compliant equilibrium, the cross-border tax evasion by U.S. residents is significantly reduced or even eliminated.¹⁹ Consistent with this theoretical prediction, Omartian (2017) uses Panama Papers data on the incorporation of offshore entities and finds a 36 percent reduction in such incorporations following FATCA, suggesting that FATCA was effective in reducing the level of offshore activity.

However, there are at least two reasons why we may not observe increased compliance post-FATCA. First, individuals with offshore accounts may be more willing to continue evasion

¹⁹ The key finding from the Dharmapala model is less about U.S. tax evasion levels decreasing (as intended by the legislation) but rather that the costs imposed on foreign financial institutions to implement FATCA are passed on to both U.S. account holders and foreign resident account holders, which then motivates foreign residents to engage in more tax evasion themselves (absent a multi-lateral country approach in information exchange).

activities in the post-FATCA period by attempting to identify other (albeit shrinking) opportunities for evasion-type activities. Alstadsaeter, Johannesen, and Zucman (2017) show in a study of Scandinavian individuals that tax evasion is concentrated within the top 0.01 percent of individuals by wealth; these are the individuals with the greatest incentives and means to afford offshore accounts, which therefore may induce different responses to tax compliance efforts. Slemrod, Blumenthal, and Christian (2001) find evidence consistent with high-wealth individuals exhibiting different attitudes towards tax compliance; in an experimental study, they find that high-income taxpayers subject to higher detection risk report *lower* income to a tax authority, possibly because these respondents are more sophisticated taxpayers who view audits as a negotiation, with reported taxable income as an “opening bid.” Furthermore, Langenmayr (2015) studies tax evasion activity after the U.S. initiated the IRS offshore voluntary disclosure program (OVDP) in 2009, which was targeted to U.S. taxpayers with offshore accounts. In response to this program, Langenmayr (2015) finds that the amount of cross-border bank deposits (as a proxy for offshore tax evasion) *increases*, which she ascribes to differential moral costs by these evading taxpayers. Thus, even though a large number of taxpayers have participated in the OVDP, under which they have remitted back taxes and begun to file the requisite report to notify the IRS of foreign bank accounts (Johannesen et al. 2017), we may continue to observe offshore tax evasion by U.S. citizens post-FATCA.

Second, an ineffective implementation of the regulation could result in continued tax evasion through alternative channels. Bacchetta and Espinosa (1995) analytically show that an effective international information exchange requires full information about foreign investments and participation by foreign authorities. However, the offshore setting presents opportunities for individuals to circumvent the automatic reporting of income. For example, Huizinga and

Nicodème (2004) use data on international (non-U.S.) information exchange in 1999 and find little effect on the amount of cross-border bank deposits, which they conclude may be due to an ineffective information exchange program.

Similarly, a number of studies of the European Union Savings Directive (EUSD) find little reduction in the overall level of offshore evasion after a change in regulation. On July 1, 2005, the European Union enacted the EUSD agreement between member states and 15 tax haven countries, including the British Virgin Islands, Cayman Islands, and Switzerland. The EUSD requires one of two actions by foreign banks in signing countries: 1) assess and remit withholding taxes on interest income earned by accounts directly owned by EU residents to the resident's home country, or 2) report the identity and interest income of accounts directly owned by EU residents to the home country. The majority of tax havens signing the directive complied with the first option to avoid disclosing their clients' names. Johannesen (2014) finds that deposits by EU residents in Swiss banks declined by as much as 40 percent following the EUSD, but he also finds that many funds were transferred to non-signing countries or to shell corporations to circumvent the law. Caruana-Galizia and Caruana-Galizia (2016) and Omartian (2017) confirm this result across other signing jurisdictions using leaked data on shell companies.²⁰

Also consistent with these findings, Johannesen and Zucman (2014) show that cross-border deposits by nonresidents shift to jurisdictions that do not impose information reporting after countries sign Tax Information Exchange Agreements. This result is attributed to the limited nature and scope of these agreements. Collectively, this evidence suggests that, in response to regulatory changes, some investors seek out alternative loopholes, banking institutions, or

²⁰ This strategy of using a shell company to circumvent the law was also a critical flaw in the U.S. qualified intermediary program and one of the reasons FATCA was implemented. In 2014, the EUSD was amended to be more similar to FATCA by also limiting this strategy. Omartian (2017) finds evidence consistent with reduced incorporations of shell companies both after FATCA and after the 2014 EUSD amendment.

jurisdictions through which to continue their tax evasion activities. Whether and to what extent FATCA will be a more effective regulation than these European predecessors given its much more extensive reach is still largely uncertain.²¹

The competing empirical and theoretical predictions described above lead us to state our hypothesis in the null form.

H1: The level of offshore tax evasion by U.S. individuals does not change after FATCA.

4. Research design

We test our research question by studying how round-tripping activity changes after countries agree to information exchange under FATCA. Specifically, we test if the amount of foreign portfolio investment into the U.S. from tax havens changes after 2012. The intuition behind the identification strategy follows that used in Hanlon, Maydew, and Thornock (2015): non-U.S. investors in other countries should be unaffected by and indifferent to FATCA regulation to which they are not subject. Thus, if haven-sourced FPI into the U.S. varies with the implementation of FATCA, this variation can be attributed to changes in tax evasion behavior by U.S. taxpayers. We identify countries affected by FATCA as those that have agreed to information exchange based on the signing of a FATCA Intergovernmental Agreement (IGA) with the U.S. We estimate the following equation:

²¹ FATCA differs from the EUSD in several important ways. First, FATCA affects all FFIs, regardless of country, and has resulted in over 100 IGAs, whereas the EUSD affected a much smaller number of tax havens and European countries. Second, while the Directive was primarily focused on obtaining unremitted taxes on foreign interest income, FATCA is designed to inhibit residents from hiding assets offshore in the first place, and therefore is not expected to generate significant revenue from withholding taxes. Third, non-compliant foreign banks themselves directly bear the incidence of the FATCA withholding tax, not the underlying account holders, and opportunities to circumvent the tax by dealing with other non-compliant FFIs decreases as more banks and countries comply. Finally, while the EUSD is imposed only on interest income, FATCA requires reporting on offshore asset balances and any cross-border payments, including interest, dividends, and gross proceeds from sales of assets. Because of these important differences, it is reasonable to expect a different response by U.S. citizens to FATCA.

$$\text{Log}(FPI_{i,t}) = \alpha_{country} + \alpha_{year} + \beta_1 \text{Haven}_i * \text{Post_FATCA}_t + \gamma \text{Controls}_{i,t} + \varepsilon_{i,t} \quad (1)$$

Our dependent variable, $\text{Log}(FPI_{i,t})$, is the natural log of the market value of annual foreign holdings of U.S. stocks or U.S. corporate bonds from country i in year t .²² We examine foreign holdings of domestic assets and describe these data in more detail below. To address serial correlation in the observations across the sample period and heteroscedasticity within the error terms, we present Newey-West standard errors with two lag orders.²³

Our variable of interest is the interaction between Haven_i and Post_FATCA_t . Haven_i is an indicator variable equal to one if country i is identified as a tax haven, following Dyreng and Lindsey (2009), and zero otherwise.²⁴ Post_FATCA_t is an indicator variable equal to one for years 2012 and later, or zero otherwise. Even though FATCA was passed in 2010, it was unclear if the law would actually have any real effect prior to 2012 due to little guidance provided by the U.S., as well as the lack of necessary cooperation by foreign countries to obtain and exchange the requisite information. On February 8, 2012, the U.S. Treasury released proposed regulations that outlined in detail the process for account identification, information reporting, and withholding under FATCA. On the same day, the Treasury also released a joint statement with five European countries that had agreed to automatic information exchange, signaling that foreign countries would indeed partner with the U.S. to provide the requisite data. Furthermore, the U.S. Treasury's Financial Crimes Enforcement Network announced shortly thereafter increased customer due diligence requirements, which would also require U.S. financial institutions to collect additional

²² Following Hanlon, Maydew, and Thornock (2015), we use measures of corporate bonds because U.S. Treasury bonds and agency debt are often held by foreign governments, not the individual investors that are of interest in this study.

²³ Prais-Winsten standard errors also correct for serial correlation but are not appropriate in our setting due to the use of annual data. Results are robust to alternative standard errors, including Newey-West standard errors with one lag and three lag orders, as well as robust standard errors and robust standard errors clustering by country.

²⁴ In Section 5 and 6, we also discuss the robustness of the results to identifying havens using an alternative Offshore Financial Center list.

information on owners of foreign accounts (Sapirie, Coder, and Parillo 2012). Collectively, these three events signaled that FATCA could actually have regulatory “teeth” to crack down on offshore tax evasion.²⁵

A negative estimate of β_1 provides empirical support that incentives to engage in round-tripping through FATCA-signing tax haven countries decrease starting in 2012, whereas an insignificant coefficient on β_1 would suggest a continuation of the same level of offshore tax evasion following FATCA. We include year fixed effects (α_{year}) to control for time-varying changes in FPI, such as those related to the overall performance of the U.S. capital markets. We include country fixed effects ($\alpha_{country}$) to control for FPI attributable to static country characteristics such as language, institutions, and geographic distance from the U.S. We note that these time and country fixed effects both 1) absorb the main effects of $Haven_i$ and $PostFATCA_t$ and 2) could capture some of the treatment effects of changes in regulatory enforcement, consistent with that noted in prior work (Hanlon, Maydew, and Thornock 2015; Christensen, Hail, and Leuz 2016).

In addition to time and country fixed effects, we control for potential determinants of portfolio investment into the U.S. following Hanlon, Maydew, and Thornock (2015): the individual tax rate in the foreign country, GDP, and population. $TaxRate_{i,t}$ is the annual individual tax rate of country i in year t , which we compile from the University of Michigan, the OECD, KPMG, the Tax Foundation, and Trading Economics. $Log(Population)_{i,t}$ is the natural log of

²⁵ In 2011, one of the IRS architects of FATCA stated that “the long-term success of FATCA may depend upon whether the U.S. can convince other countries to adopt a similar system or joint with the U.S. in developing a multilateral FATCA system” (Harvey 2012). This suggests that even in 2011 it was unclear if FATCA would be effective. As further anecdotal evidence that 2012 is the appropriate year to consider, one practitioner referred to the events in February of that year as “dramatic evidence of the intention of the participating countries to ultimately provide for automatic exchange of information on a broader basis” (Sapirie, Coder, and Parillo 2012). Wheeler (2012) also cites the February 2012 date as the date on which the Proposed Regulations, “intended to implement the FATCA legislation” were published. Omartian (2017) also does not identify the post-FATCA period based on passage of the law in 2010. Instead, he similarly identifies the post-FATCA period as years including and following 2013 based on promulgation of the final Treasury regulations in January of that year.

country-year population, which we obtain from the World Bank. $\text{Log}(GDP)_{i,t}$ is the natural log of country-year gross domestic product, which we also obtain from the World Bank.

We note three important deviations from the research design and sample of Hanlon, Maydew, and Thornock (2015). First, their sample covers 39 countries from 1984 to 2008 and ends prior to FATCA. Therefore, we update the sample period to the most recent ten years, from 2006 to 2015, to include the FATCA regime. This sample period permits us to study the extent of round-tripping in a more recent period and also allows us to test the effect (if any) of other relevant dates, including the UBS whistleblower in 2008 and the passage of FATCA in 2010. Second, we include 19 additional countries, such that our final sample includes country-year observations for 54 countries with sufficient data in each year of the sample period. Third, we use annual observations of FPI into the U.S. as the dependent variable rather than monthly observations given that our variables of interest, as well as the other independent variables, vary on an annual basis. In Appendix A, we demonstrate step-wise how the sample period and sample composition affect estimation, beginning by reproducing Hanlon, Maydew, and Thornock (2015) Table III, Column (1).

Consistent with this earlier paper, we note several caveats about these tests. First, if other factors affecting the level of FPI occur contemporaneously with FATCA implementation, we could attribute our results to a change in tax evasion by U.S. individuals when they are actually attributable to these other confounding factors. However, our primary identification strategy relies on cross-sectional variation between tax haven countries and non-havens, so any confounding effects would have to affect havens differently than non-havens and at roughly the same time as FATCA implementation. We are unable to identify any such effects. Similarly, a finding of decreased FPI into the U.S. could simply reflect a declining time trend; however, because a

downward time trend would be contrary to observed increases in FPI over time, a general downward time trend confounding our interpretation of results is likely not a concern in our setting. In additional tests, we attempt to rule out other possible confounding factors through falsification tests.

In subsequent tests, we re-estimate Eq. (1), replacing the dependent variable with measures of cross-border FPI measured using CPIS data (from the IMF) as well as with the level of hidden assets calculated following Zucman (2013b). We describe all data in the next section.

5. Empirical analysis

5.1 Data and sample

We obtain data on U.S. securities positions held by foreign investors from the U.S. Treasury International Capital (TIC) System. These annual magnitudes of cross-border investment assets are based on surveys of U.S. banks, financial institutions, broker/dealers, and custodians of securities required to be completed under the International Investment and Trade in Services Survey Act. These data have been used extensively in prior research (e.g., Hanlon, Maydew, and Thornock 2015; Desai and Dharmapala 2010; Thomas, Warnock, and Wongswan 2006). The cross-border nature of the data ensures that our sample only includes foreign holdings of U.S. securities, and not foreign-to-foreign or U.S.-to-U.S. transactions. We focus on foreign holdings of U.S. equity and debt because these assets are more likely held by individual investors, who are the focus of our study. We exploit “custodial bias” (Bertaut and Tryon 2007) in the data; because investors often use foreign banks to maintain custody of securities purchased from another country, investments in U.S. securities by a U.S. investor via an account in Switzerland would be attributed to Switzerland and not to the U.S. in the TIC data. Given that the regulation in question in this study affects U.S. account holders in Switzerland and not Swiss account holders, we interpret

changes in FPI following the implementation of FATCA as being sourced to U.S. investors, who (prior to FATCA) were possibly engaging in round-tripping to evade U.S. income taxes.

Table 1 presents the 54 countries that comprise our main sample. We identify these countries starting with the sample of all 201 countries and territories that have some available TIC data. We then drop countries without requisite data for the full sample period to construct measures of equity and debt investment into the U.S., as well as the control variables included in our main test. This results in a final sample of 540 country-years.²⁶

In Column (1), we first identify if the country has agreed to implement FATCA information exchange. While FATCA is intended to affect all foreign financial institutions, we identify those jurisdictions that are most likely to implement and enforce the legislation based on whether the country has agreed to information exchange. The indicator “FATCA Country” in Column (1) is equal to one if the country has signed a FATCA Intergovernmental Agreement as of 2015, or zero otherwise.²⁷ The non-signers at the end of the sample period include Argentina, Ecuador, Egypt, Guatemala, Lebanon, Morocco, Russia, and Uruguay. We identify the following nine sample countries as tax havens based on the list of countries published in Dyreng and Lindsey (2009): the Bahamas, Bermuda, Ireland, Lebanon, Luxembourg, Panama, Singapore, Switzerland, and

²⁶ Appendix A reconciles the sample of 39 countries included in Hanlon, Maydew, and Thornock (2015) to the 54 countries we include in our sample. The samples reflect an overlap of 35 countries, as four of the countries (Liberia, Netherlands Antilles, Taiwan, and Venezuela) included in the Hanlon, Maydew, and Thornock (2015) sample either no longer exist or do not have available data for the full sample period. Following Hanlon, Maydew, and Thornock (2015), we exclude the Cayman Islands due to the fact that the results may capture legal tax avoidance (such as investment via hedge funds) and also because the data reported in CPIS by the Caymans changed significantly in 2015. In Section 6, we discuss the robustness of our results to including the Caymans. We include 19 additional countries for which Treasury and World Bank data are available for the more recent sample period to measure foreign investment and control variables. These countries are Belgium, Canada, Ecuador, France, Hungary, Ireland, Israel, Luxembourg, Malaysia, Mexico, Morocco, New Zealand, Norway, Poland, Romania, the Russian Federation, Serbia, South Korea, and Uruguay.

²⁷ The IRS publishes the list of countries that have signed an IGA, which is located at <https://www.treasury.gov/resource-center/tax-policy/treaties/Pages/FATCA.aspx>. As of 2017, approximately 90 countries had not yet executed an IGA; the non-signers included the eight countries listed above as well as many countries in the Middle East (8), Africa (46), Central and South America (9), and Oceania (12) (Deloitte 2017).

Uruguay. Our tests examine FPI behavior from these haven countries into the U.S. following implementation of FATCA, relative to non-haven FATCA countries and non-FATCA havens.

Columns (3) through (9) present mean values for the dependent and control variables by country; Columns (3) and (4) present the equity and debt FPI values from each country into the U.S., and Columns (5) and (6) present the total worldwide equity and debt FPI from each country using CPIS data. We observe high levels of inbound investment from important economies such as Canada, China, Japan, and the U.K. We also observe large average inbound investments from haven countries such as Ireland, Luxembourg, Singapore, and Switzerland. At the bottom of the table, we present averages for the full sample, as well as for the subset of FATCA (n=460) and non-FATCA (n=80) country-year observations. Mean equity FPI (debt FPI) for the full sample is \$61.2 (\$39.8) billion. We observe higher average equity and debt $FPI_{i,t}$ for the sub-sample of countries that sign an Intergovernmental Agreement to implement FATCA, and these differences across the two sub-samples are statistically significant. We also observe significant differences for each of the control variables – FATCA countries on average have higher GDP, population, and individual income tax rates.²⁸

Table 2 presents correlations of our regression variables. The correlations show that GDP and the local tax rate are positively and significantly correlated with investment from a foreign country into the U.S., whereas inbound investment is negatively and significantly correlated with population. This association could be attributable to investments from havens, which are countries with relatively low populations. Indeed, we observe a positive and significant correlation between

²⁸ Note that some of the countries that we identify as haven countries seem to report relatively high individual tax rates (for example, Ireland has a 47.22 percent tax rate, and Luxembourg has a 40.82 percent rate). These rates apply to citizens (and some residents), whereas non-residents are likely subject to lower tax rates or possibly even no tax, which contributes to their designation as a tax haven jurisdiction.

the haven indicator and the amount of inbound investment to the U.S., consistent with the descriptive statistics for these haven countries presented in Table 1.

5.2 Hypothesis test

Table 3 presents results of our hypothesis tests. Columns (1) and (2) present estimations using the logarithm of equity FPI as the dependent variable, and Columns (3) and (4) use the logarithm of debt FPI. We estimate each regression (equity and debt) on the 460 FATCA country-years and on the 80 non-FATCA country-years. Recall that all specifications include controls for country and year fixed effects that subsume the main effects of the $Haven_i$ and $Post_FATCA_t$ indicator variables.

In Column (1), we observe a statistically significant decline in equity FPI from FATCA haven countries following the implementation of FATCA; the coefficient of -0.252 implies a 22.3 percent reduction in inbound FPI post-FATCA. This result suggests that round-tripping into the U.S. through tax havens significantly declined, starting in 2012. Importantly, we observe no difference in the amount of U.S. round-tripping activity from non-FATCA signing havens after 2012 in Column (2). This lack of result further validates our identification strategy by demonstrating that the overall level of round-tripping from haven countries was not declining after 2012 and that the effect we observe is confined to FATCA-signing haven countries.

Interestingly, we also observe a significant increase in debt FPI for haven countries after 2012 in Column (3) (coefficient = 0.322). Although we interpret the coefficient in Column (1) as evidence of changes in tax evasion behavior, we could instead be capturing changes in investors' preferences that result in a substitution of corporate debt instruments for equity holdings. However, two tests mitigate this concern. First, in untabulated tests, we re-estimate the results using total FPI (equity plus debt) and observe a negative coefficient (-0.130, p-value < 0.10),

suggesting that the decrease in equity investment holdings was not completely offset with an increase in debt securities.

Second, we find that the decline in equity and increase in debt holdings occurs in different countries, as shown in Table 4. Specifically, we re-estimate Eq. (1) replacing $Haven_i$ with separate indicator variables for each haven country. Consistent with the possible substitution of debt for equity, we observe a decrease in equity investments and an increase in debt investments in Panama and Singapore; however, untabulated analysis using total FPI (equity plus debt) shows that the increase in debt holdings does not completely offset the reduction in inbound equity investments in Panama (coefficient of -0.499, $t=3.75$). Importantly, we do not observe similar offsetting increases in debt investments in the Bahamas and Switzerland. Further, Ireland exhibits increases in both equity and debt holdings, suggesting that the increases in debt holdings are not always offset by decreases in equity holdings in the same country. Therefore, the effects we observe do not appear to reflect only a substitution of debt for equity investments in the post-FATCA period.

The tests in Table 4 are also motivated by reports that some countries continue to provide bank secrecy despite nominally signing on to FATCA; the most notable example is Panama, which suffered severe repercussions from the 2015 leak of financial and legal records exposing entities designed to hide assets. In Table 4, we find that the decline in equity FPI from FATCA havens is driven by the Bahamas, Panama, Singapore, and Switzerland. These countries report a decline in total FPI of 39.3 percent, 45.7 percent, 42.2 percent, and 17.1 percent, respectively. In contrast, Ireland reports a 23.2 percent increase in the amount of inbound equity FPI to the U.S., despite signing on to FATCA. The results show that the significant decrease in equity FPI following FATCA exists for four important tax haven countries.

In sum, the results presented in Tables 3 and 4 show a decrease in the amount of inbound U.S. equity investment holdings from haven countries since 2012. This result is consistent with a reduction in round-tripping tax evasion activities following the implementation of FATCA. In subsequent tests, we further examine whether this result is consistent with increased compliance or a shift in the type or location of tax evasion activities.

5.3 Falsification tests in 2008 and 2010

One possible concern is that the effect we observe exists for the subset of FATCA-signing tax haven countries throughout the sample period (not just from 2012) and that the inbound FPI from these countries is simply on average different from the other countries included in the sample. To address this concern, we perform two falsification tests in which we examine the relationship between inbound U.S. investment holdings and the same FATCA-signing haven countries in periods prior to 2012. Specifically, we study how inbound FPI changed following the UBS whistleblower's arrest in 2008 and after the passage of the FATCA legislation in 2010. The results of these tests improve identification of the main FATCA effect, as well as provide evidence of the relative effect each of these important events had on offshore tax evasion activity.

The first event is the UBS whistleblowing by Bradley Birkenfeld in March of 2008 that led to a U.S. Department of Justice (DOJ) criminal investigation. UBS was charged with conspiring to defraud the U.S. by offering cross-border private banking services actively marketed to U.S. clients through its non-U.S. regulated units. U.S. clients could open Swiss accounts, which would then facilitate tax evasion via non-reporting of income earned on the Swiss assets. The company ceased offering such services in July of 2008 and agreed to pay a penalty of \$780 million to the U.S. government in February of 2009.

These events triggered heightened awareness of the use of foreign accounts by U.S. taxpayers to evade U.S. taxes, uncertainty by UBS's U.S. clients over whether Birkenfeld or UBS would provide account holder information as a part of the investigation, as well as discussions by legislators and Treasury regarding how to combat such behavior. By the end of 2008, the IRS initiated a voluntary disclosure program for U.S. citizens to voluntarily pay taxes and penalties owed on hidden foreign assets. In November 2009, the IRS reported that more than 14,700 U.S. taxpayers had come forward and disclosed their previously secret foreign bank accounts, citing the highly public UBS case as the motivation for the amnesty program's success (Browning 2009). We therefore examine 2008 as the first alternative event date.

Panel A of Table 5 presents results from testing how inbound FPI from tax havens changed after 2008. For these tests, we shorten the sample period to four years (from 2006 to 2009) to focus on the effect of this earlier event without the confounding effects of FATCA legislation and subsequent implementation in 2010 and 2012, respectively. We re-estimate Eq. (1) after replacing $Post_FATCA_t$ with an indicator variable $Post_2008_t$, which is equal to one for years 2008 and 2009, and zero otherwise. We also acknowledge that this period is significantly affected by the financial crisis, and thus any results should be interpreted with caution. As before, we estimate the results using equity and debt FPI as the dependent variable, and we test the relationship across the sub-sample of FATCA signing countries in Columns (1) and (3) and the sub-sample of non-FATCA signing countries in Columns (2) and (4). In all cases, the variable of interest is the interaction between $Haven_i$ and $Post_2008_t$. The coefficient in Column (1) suggests a decrease in 2008 and 2009 inbound equity FPI from the ten haven countries identified using the Dyreng and

Lindsey (2009) list. However, in untabulated results, we re-estimate Eq. (1) using the IMF Offshore Financial Center list and find no effect across any of the specifications.²⁹

We obtain similar results in Panel B of Table 5, in which we test for changes in the amount of inbound FPI in the four-year period centered on 2010. We again caveat that these tests overlap the financial crisis period, and so any results should be interpreted with caution. Even though the FATCA legislation was passed in 2010, practitioner and policy discussion following this legislation reflected significant uncertainty regarding the effectiveness of the law prior to 2012. Thus, whether investors would respond to this event with any real changes in investment location was unclear. We redefine $Post_FATCA_t$ in Eq. (1) as $Post_2010_t$, which is an indicator variable equal to one for years 2010 and 2011, and zero otherwise. We observe no significant effect. We also re-estimate these results using the IMF OFC list and similarly find no result across any of the specifications.

Collectively, these results in Table 5, as well as the untabulated analysis, confirm that the effects we document in 2012 did not also exist to the same extent in earlier years, despite the increased scrutiny from the UBS case and the passage of U.S. legislation to mitigate offshore tax evasion. Instead, these results show that investors appear to respond to the increased reporting requirements once the U.S. Treasury provided implementation guidance and once foreign governments agreed to be essential partners in the cross-border information exchange.

²⁹ The Offshore Financial Centers (OFC) list identifies the following 11 sample countries as tax havens: the Bahamas, Bermuda, Hong Kong, Ireland, Lebanon, Luxembourg, Malaysia, Panama, Singapore, Switzerland, and Uruguay.

6. Worldwide FPI analysis and robustness tests

6.1 *Worldwide FPI from haven jurisdictions*

The results presented thus far exploit cross-border investment from foreign countries into the U.S. to detect changes in the location of hidden offshore assets after FATCA. Although prior literature documents the home bias that shows that investors prefer to invest in securities of their home country, wealthy U.S. persons with offshore accounts likely also make investments in other countries that are not captured using the TIC data. Therefore, we extend our analysis by using data from the IMF's Coordinated Investment Portfolio Surveys. Through these surveys, the IMF gathers data on the relative holdings of financial securities across more than 73 countries. These data permit us to study cross-country investments between tax havens and many more countries than just the U.S. We use both the raw CPIS data as well as the data adjusted following Zucman (2013b). As described in the data appendix (Zucman 2013a), the CPIS data are used in a gravity-like model to estimate amounts for countries that do not report in CPIS. Multiple independent supplemental data sources are then used to correct the amounts derived using the CPIS data and construct estimates of the assets held by each country.

As before, we expect that, after signing an Intergovernmental Agreement to exchange information under FATCA, the amount of investment out of haven countries will decline. This decline should not only be reflected by reduced investment levels into the U.S. but also by reduced investment levels into other countries as well.³⁰ We therefore employ a similar research design as

³⁰ One concern with this test is that any change in FPI out of the haven countries may reflect U.S. individuals' investments in other countries (as we intend to study), as well as changes in investment locations by non-U.S. individuals (which we do not intend to study). However, we are only aware of one other significant event that would affect non-U.S. investors' investment location preferences in FATCA-signing havens relative to non-havens: the Common Reporting Standard, which is the "FATCA-equivalent" for other countries, was passed in 2014, and the first reporting is not required until September 2017. Ending the sample in 2015 helps to mitigate concerns that any effects we detect using these worldwide data are driven by CRS reporting effects and/or by non-U.S. investors. Furthermore,

before to test if the amount of equity and debt FPI into other countries from FATCA-signing havens declines after FATCA.

We present results in Table 6. Panel A uses CPIS data as reported by the IMF; Panel B adjusts these data following Zucman (2013a). In each panel, Columns (1), (2), (5), and (6) present estimations using the logarithm of equity FPI as the dependent variable, and Columns (3), (4), (7), and (8) use the log of debt FPI. The first four columns include all countries in the analysis, while the second four columns exclude the U.S. to mitigate concerns that U.S. effects (as already examined using the TIC data in Table 3) are driving the results in Column (1). Across both panels, we observe a decline in equity FPI from FATCA haven countries in the post-FATCA period in Column (1); the coefficient of -0.367 (-0.270) in Column (1) of Panel A (Panel B) means that equity FPI out of FATCA-signing haven countries declined by approximately 30.7 (23.7) percent. These results confirm the earlier results focused on changes in inbound U.S. investment and suggest that other economies (not just the U.S.) experienced a decline in FPI from FATCA-signing havens after 2012, which we attribute to the FATCA reporting requirements. The negative and significant coefficient of -0.302 (-0.295) in Panel A (Panel B) confirms that the decline in FPI out of haven countries occurs for countries other than the U.S. Untabulated analysis by haven country further shows that the results are driven by Luxembourg, Singapore, and Switzerland. We observe no differences in the amount of debt FPI out of haven countries in Columns (3) and (7) of both panels. Falsification tests around 2008 and 2010 further confirm that the results did not exist in prior periods.

These data also permit us to test where the investment funds moved to. In Tables 3 and 5, we observed a positive, but insignificant, coefficient on the non-signing FATCA haven countries,

in untabulated tests, we drop 2014 and 2015 from the sample period and continue to find consistent results. We discuss these results in Section 6.3.

which we interpreted as lack of evidence that investment funds moved into these countries. Similarly, in Column (2) of Table 6 Panel A, we observe a positive but insignificant coefficient on the amount of equity FPI into non-signing countries from tax havens, post-FATCA. However, in Column (6) of Panel A, we find some evidence that the amount of investment from non-FATCA havens increased since 2012 based on the positive and statistically significant coefficient (0.924). This result suggests that investors moved some assets into non-signing haven jurisdictions post-FATCA.

We note that the lack of robustness of this result to other specifications could result from low power attributable to the small sample of full country panels available to estimate this regression. In untabulated tests, we relax this restriction and include an additional ten country-years in the estimation of Column (2). Using this larger sample, we find a positive and significant coefficient (0.536). This result suggests that the amount of investment to all countries (including the U.S.) from non-signing haven countries, which include Lebanon and Uruguay, increased by approximately 70.9 percent. While both countries report an increase in the amount of inbound FPI, we note that this large percentage change is driven in part by these countries reporting relatively low amounts of outbound FPI prior to 2012.

We perform two sets of additional untabulated analysis using these CPIS data. First, we re-estimate the model using total (equity plus debt) FPI. Using both the originally reported CPIS data, as well as the CPIS data adjusted following Zucman (2013b), we continue to find a negative and significant coefficient for total FPI from FATCA-signing countries (coefficients of -0.134 and -0.141, respectively). Also consistent with the main results, we observe a positive and statistically significant increase in investment out of non-signing havens (coefficient of 0.302).

Second, we re-estimate the results using the IMF's OFC list. In addition to finding a negative coefficient on the amount of equity investment out of countries post-FATCA, we also find an increase in the level of assets invested out of non-signing havens (coefficient = 0.536 out of all countries; coefficient = 0.913 after excluding the U.S.). These results confirm the effect of FATCA on worldwide investments and provide further evidence of hidden assets moving from country to country as U.S. individuals shop for the jurisdiction that provides secrecy and that insulates U.S. citizens from complying with the U.S. tax reporting requirements.

6.2 *Change in estimated amount of hidden assets*

As a third test of the effect of FATCA on the location of financial assets, we use additional aggregate data from the IMF on countries' International Investment Position to construct an estimate of the amount of hidden assets in each jurisdiction. We then study whether this level of hidden assets changes post-FATCA. Specifically, we follow Zucman (2013a) and measure the extent to which a country's reported non-resident investment assets exceed the reported non-resident investment liabilities. The difference in the reported amounts is a "gap" that Zucman (2013b) attributes to offshore assets hidden for tax evasion purposes.

Panel A of Table 7 provides descriptive statistics on the estimate of the gap. The average equity gap in FATCA countries is \$64.7 billion, nearly nine times larger than that of non-signing countries (\$7.4 billion). Similarly, the amount of the gap using debt investments is larger for FATCA countries relative to non-FATCA signing countries (\$29.6 billion as compared to \$2.7 billion). In untabulated analyses, we compare our estimates of the equity gap to the Zucman (2013a) amounts for the three years for which our samples overlap (2006-2008) to confirm our calculations. We find a high correlation of 0.99 between the two samples, further validating that we have constructed the measure consistent with the methodology used in prior literature.

Panel B presents results from regressions that use the level of hidden assets as the dependent

variable in Eq. (1).³¹ Consistent with our earlier results, we observe that the amount of hidden assets has declined since 2012 within the FATCA-signing haven countries. The coefficient of -0.342 means that the amount of hidden assets in FATCA-signing havens declined by 29 percent after 2012. We observe no effect for the non-signing countries or for debt investments. In falsification tests, we again find no statistically significant effect when studying the periods around 2008 and 2010.

6.3 *Additional analysis of non-signing countries*

The results presented in Tables 3 through 7 compare responses by haven countries to other countries, whether FATCA-signing or non-FATCA signing jurisdictions. This approach assumes that investors move assets from one FATCA-signing haven jurisdiction to a non-FATCA signing haven. However, if investors are intending to conceal asset locations, they may consider moving assets to any non-FATCA signing country, not only those that are tax haven jurisdictions. Recall that the sample of non-signing FATCA countries for which we have full panel data include Argentina, Ecuador, Egypt, Guatemala, Morocco, and Russia (all non-havens), as well as Lebanon and Uruguay (havens). We acknowledge that many factors affect investment location in addition to agreement to tax information exchange (such as rule of law, investment opportunities, etc.) and that these six non-haven countries may not be optimal locations for tax-motivated investments. Nonetheless, we conduct an additional test in which we study whether equity and debt FPI out of these eight non-signing countries (not just the two haven jurisdictions) change post-FATCA.

Using the TIC data, we find that the amount of inbound equity FPI to the U.S. from the non-signing countries increases post-FATCA (coefficient = 0.310, $p < 0.01$). Thus, while we did not

³¹ To mitigate the effects of extreme outliers in the distribution of gaps, we truncate the sample at 5% and 95%. In addition, because the calculated gaps can be positive or negative, we first add the minimum value of the variable to all observations to use the logarithmic transformation. Results are robust to using a log modulus transformation to allow inclusion negative gap values in estimation.

find a statistically significant coefficient in Table 3 on the non-signing havens, this result suggests that investors view the broader non-signing FATCA countries as potential destinations from which to engage in round-tripping behavior.

6.4 *Robustness analysis*

We also conduct several robustness analyses. First, we re-estimate our results using the Offshore Financial Center list from the IMF, which includes Malaysia and Hong Kong as tax haven countries in addition to the other countries identified by Dyreng and Lindsey (2009). We find consistent results using this list.³² Specifically, we observe significant decreases in equity FPI into the U.S. from the Bahamas, Panama, Singapore, and Switzerland, and, consistent with expectations, we observe no result around 2008 and 2010 in the falsification tests.

In 2014, several countries agreed to the Common Reporting Standard (CRS), under which many countries would exchange information on foreign account holders. While reporting under CRS is not scheduled to begin until late 2017, one concern with the CPIS analysis is that worldwide investment flows could be affected by changes in non-U.S. investors' investment locations in anticipation of CRS reporting. Therefore, we re-estimate the CPIS results dropping both 2014 and 2015 from the sample period and continue to find consistent (and even stronger) results.

The Cayman Islands are excluded from our main tests for comparability with prior research and to mitigate concerns about large variation in the data reported by the country to CPIS.³³ When we include the Cayman Islands, all inferences using the TIC data (Tables 1 through 5) remain

³² When using the OFC list, we continue to find a negative and statistically significant coefficient on total FPI into the U.S., as well as a negative (but insignificant) coefficient on equity FPI into the U.S. The analysis of U.S. round-tripping by haven country using the OFC list reveals that Malaysia, one of the two additional havens on the OFC list, has a significant increase in the amount of inbound investment to the U.S. post-FATCA. Results are consistent with the main results in Table 3 when excluding Malaysia.

³³ According to CPIS, the total amount of equity invested from the Cayman Islands in to the rest of the world each year (in \$billion) is as follows. 2006: \$2.5; 2007: \$2.3; 2008: \$0.6; 2009: \$1.0; 2010: \$2.0; 2011: \$1.7; 2012: \$2.4; 2013: \$1.7; 2014: \$1.6; 2015: \$678.6. The 424-fold increase from 2014 to 2015 is most likely the result of fundamental changes in the reporting by the country to CPIS.

unchanged. As expected, the large change in the CPIS data for the Cayman Islands in 2015 eliminates the significance on *Haven*Post_FATCA* in Tables 6 and 7. When we rerun these tests excluding 2015, results using the CPIS data (Table 6, Panel A) are consistent with those excluding the Cayman Islands, and the results using CPIS data as adjusted following Zucman (2013a) (Table 6 Panel B) remain insignificant.

6.5 *Future work*

In future work, we intend to conduct additional tests aimed at determining where offshore investment wealth moved following FATCA reporting. In addition to moving brokerage accounts to non-FATCA countries, investors may liquidate some portion of their offshore portfolios and either hold cash or use the cash to invest in alternative investments. To test the latter, we intend to examine real estate spending and rare art prices as two potential sectors in which offshore wealth may be invested. While we acknowledge difficulties establishing causality if we observe a positive relation between FATCA and spending in these sectors, these tests would provide some evidence of other potential outcomes of FATCA. Observing these predicted responses would suggest that FATCA not only had a real effect on the location of offshore wealth, but also resulted in a shift in the type of assets purchased by offshore investors.

7. **Conclusion**

Our study examines “round-tripping” tax avoidance by U.S. persons following the implementation of a U.S. tax reporting regime that increased the scrutiny and regulation of such behavior. Using annual country-level data on foreign portfolio investments into the U.S. from 2006 to 2015, we document an economically significant decrease in round-tripping from tax haven countries that agree to this information exchange. In subsequent tests, we observe that the overall amount of foreign portfolio investment out of non-FATCA haven countries increases since 2012.

We interpret these results as evidence that the FATCA regulation is associated with individuals re-locating investment assets to jurisdictions that continue to provide secrecy.

We acknowledge that there may be other confounding effects that could be contributing to the results we observe. However, we use a research design in which these effects would need to disproportionately affect inbound investments from haven countries that have signed a FATCA Intergovernmental Agreement relative to other countries. The 2008 and 2010 falsification tests that we conduct help to mitigate concerns that the effects we document exist prior to 2012 and also provide evidence of the significance of this reporting change in affecting offshore evasion. Furthermore, our tests using haven-specific indicators mitigate concerns that a decrease in equity FPI is offset by a commensurate increase in debt investments.

Our study is timely given current political activity on FATCA and similar legislation worldwide. Several countries have proposed and have begun to implement information exchange agreements similar to FATCA, though notably the U.S. has yet to sign on to these international initiatives. Domestically, there have been calls for the repeal of FATCA as recently as April 2017, primarily on the basis that the administrative costs to foreign financial institutions and U.S. citizens living abroad are too high; furthermore, in August 2017, a case involving FATCA was appealed to the U.S. Supreme Court. Our study provides some first evidence on the cost of repealing these regulations in the U.S. or of not implementing similar standards internationally.

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Appendix A
Reconciliation of Sample to Hanlon et al. (2015)

	1984-2008		2006-2015	
	<i>Hanlon et al.</i> (2015) Table III, Col. 1	<i>Replication with</i> <i>Annual</i> <i>Measurement</i>	<i>FATCA tests with</i> <i>Hanlon et al.</i> (2015) Countries	<i>Final Sample</i> <i>with all</i> <i>Countries</i>
	(1)	(2)	(3)	(4)
<i>Haven*Post_2001</i>	-0.483*** (0.036)	-0.257** (0.128)		
<i>Haven*Post_FATCA</i>			-0.207*** (0.076)	-0.218*** (0.080)
<i>Tax Rate</i>	0.007*** (0.001)	0.013*** (0.004)	0.013** (0.006)	0.007 (0.006)
<i>Log(Population)</i>	-1.991*** (0.117)	-1.905*** (0.608)	-2.701** (1.069)	-1.141 (1.068)
<i>Log(GDP)</i>	0.061** (0.030)	0.091 (0.168)	0.634** (0.246)	0.405** (0.194)
Country fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	11,271	975	350	540
Adjusted R ²	0.978	0.932	0.983	0.984
Unit of observation	Monthly	Annual	Annual	Annual

Notes: This table reports the replication of the results from Hanlon, Maydew, and Thornock (2015) for the 1984-2008 period and extends their methodology to the 2006-2015 sample period. In Column (1), we report the results from Table III, Column (1) of Hanlon, Maydew, and Thornock (2015). The 11,271 observations include 39 countries, each with full time series of 289 monthly observations between December 1984 and December 2008. Column (2) is a replication of the Column (1) result using annual data for the period 1984 through 2008. Column (3) reports results from estimating Eq. (1) on the sample period 2006 to 2015 for 35 of the 39 Hanlon, Maydew, and Thornock (2015) countries (excluding Liberia, Netherlands Antilles, Taiwan, and Venezuela) for which full data for the entire sample period is available. Column (4) presents estimation on the sample of 54 countries for which data for the full sample period from 2006 to 2015 is available; in Table 3, we present this estimation after partitioning on whether the country has signed an Intergovernmental Agreement (IGA) to implement FATCA. In addition to the 35 countries included in Hanlon, Maydew, and Thornock (2015), the sample in Column (4) also includes data on 19 additional countries, including: Belgium, Canada, Ecuador, France, Hungary, Ireland, Israel, Luxembourg, Malaysia, Mexico, Morocco, New Zealand, Norway, Poland, Romania, Russian Federation, Serbia, South Korea, and Uruguay. The dependent variable is the natural log of equity foreign portfolio investment into the U.S. as reported by the U.S. Treasury. *Haven* is an indicator equal to one if the country is identified as a tax haven in Hanlon, Maydew, and Thornock (2015) (Columns 1 and 2) and Dyreng and Lindsey (2009) (Columns 3 and 4). *Post_2001* (*Post_FATCA*) is an indicator variable equal to one for years 2001 (2012) and later, or zero otherwise. *Tax Rate* is the highest individual tax rate of the country, compiled from the University of Michigan, the OECD, KPMG, the Tax Foundation, and Trading Economics. *Log(Population)* is the natural logarithm of the country-year population, and *Log(GDP)* is the natural log of country-year gross domestic product (in USD millions), both of which are obtained from The World Bank website. The specifications include country and time fixed effects, which subsume the main effects for *Haven* and *PostXXXX*. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively, and standard errors are adjusted using the Newey-West procedure.

Table 1 - Sample Composition and Descriptive Statistics

	FATCA Country (0/1)	Haven Country (0/1)	Mean U.S. Equity FPI (\$M)	Mean U.S. Debt FPI (\$M)	Mean WW Equity FPI (\$M)	Mean WW Debt FPI (\$M)	Country GDP (\$M)	Country Population (M)	Tax Rate (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ARGENTINA	0	0	4,024	1,684	11,935	8,688	473,151	41.46	35.00
AUSTRALIA	1	0	112,929	25,900	294,958	174,170	1,200,847	22.19	45.20
AUSTRIA	1	0	8,229	3,144	86,189	257,847	401,513	8.41	50.00
BAHAMAS	1	1	18,629	5,470	1,300	11,922	8,218	0.36	-
BELGIUM	1	0	25,144	336,475	255,310	459,238	490,118	10.95	53.69
BERMUDA	1	1	68,474	93,436	83,525	397,228	5,726	0.07	-
BRAZIL	1	0	3,327	1,005	12,308	10,365	1,980,881	199.47	27.50
CANADA	1	0	476,957	105,753	654,339	182,483	1,609,250	34.20	40.90
CHILE	1	0	17,269	1,998	78,684	26,509	218,847	17.11	40.00
CHINA	1	0	169,179	22,430	168,730	112,100	6,871,760	1,341.02	45.00
COLOMBIA	1	0	6,683	1,539	7,942	8,987	288,979	46.11	33.65
DENMARK	1	0	38,966	17,986	155,888	176,301	323,173	5.56	48.45
ECUADOR	0	0	440	379			75,472	15.06	33.00
EGYPT	0	0	287	376	868	2,613	223,930	83.35	21.50
FINLAND	1	0	12,025	3,438	125,419	151,724	255,871	5.38	50.19
FRANCE	1	0	130,734	49,687	676,435	2,000,641	2,685,461	65.17	42.20
GERMANY	1	0	94,780	87,097	808,057	1,822,879	3,530,420	81.72	47.05
GREECE	1	0	2,559	1,181	12,644	108,741	277,904	11.02	39.62
GUATEMALA	0	0	245	184			45,707	14.90	23.80
HONG KONG	1	0	46,758	16,816	552,060	350,003	245,411	7.07	15.20
HUNGARY	1	0	577	167	7,168	1,947	133,235	9.97	25.60
INDIA	1	0	1,185	671	1,178	82	1,615,906	1,238.09	31.44
INDONESIA	1	0	371	508	1,587	6,510	707,348	243.31	31.50
IRELAND	1	1	125,596	158,516	637,942	1,338,209	247,110	4.53	47.22
ISRAEL	1	0	21,630	3,326	36,263	31,980	241,210	7.70	47.80
ITALY	1	0	20,275	5,776	509,699	610,869	2,130,140	59.45	44.40
JAMAICA	1	0	122	189			13,512	2.69	26.00
JAPAN	1	0	284,661	149,728	727,993	2,337,801	4,959,720	127.68	48.73
LEBANON	0	1	519	66	2,227	3,181	36,881	4.45	20.00
LUXEMBOURG	1	1	309,766	372,796	1,300,826	1,687,210	54,927	0.52	40.82
MALAYSIA	1	0	5,488	2,555	26,253	12,451	261,445	28.33	26.60
MEXICO	1	0	24,771	10,073	2,649	35,074	1,110,409	119.35	30.30
MOROCCO	0	0	50	6			94,086	32.41	39.60
NETHERLANDS	1	0	171,080	65,811	677,010	885,542	841,309	16.64	52.00
NEW ZEALAND	1	0	8,457	1,672	34,308	15,841	154,785	4.37	35.55
NORWAY	1	0	117,379	29,148	411,976	354,954	443,977	4.92	39.80
PANAMA	1	1	8,417	3,320	553	7,251	33,010	3.65	25.80
PERU	1	0	4,891	1,768	15,069	7,082	153,812	29.61	30.00
PHILIPPINES	1	0	1,314	389	180	6,402	213,708	93.95	32.00
POLAND	1	0	1,413	390	10,149	6,297	479,299	38.08	34.40
PORTUGAL	1	0	2,601	751	35,917	128,685	230,917	10.50	45.09
ROMANIA	1	0	45	120	913	1,357	176,466	20.32	16.00
RUSSIAN FEDERATION	0	0	328	376	3,606	36,669	1,588,978	143.18	13.00
SERBIA	1	0	11	0			41,599	7.26	15.00
SINGAPORE	1	1	111,001	38,927	329,720	326,861	241,698	5.08	20.00
SOUTH AFRICA	1	0	4,035	659	111,920	8,335	337,405	51.29	40.00
SOUTH KOREA	1	0	26,785	13,040	93,528	45,978	1,165,226	49.56	36.73
SPAIN	1	0	8,714	5,345	157,004	387,244	1,408,716	46.15	46.41
SWEDEN	1	0	72,479	11,626	321,183	148,397	509,230	9.42	56.64
SWITZERLAND	1	1	228,473	102,029	472,855	640,463	599,736	7.87	24.50

Table 1 (continued)
Sample Composition and Descriptive Statistics

	FATCA Country (0/1)	Haven Country (0/1)	Mean U.S. Equity FPI (\$M)	Mean U.S. Debt FPI (\$M)	Mean WW Equity FPI (\$M)	Mean WW Debt FPI (\$M)	Country GDP (\$M)	Country Population (M)	Tax Rate (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
THAILAND	1	0	1,811	804	6,274	17,448	338,682	66.94	36.40
TURKEY	1	0	225	73	297	1,542	715,728	72.90	35.00
UNITED KINGDOM	1	0	503,229	392,969	1,318,824	2,059,087	2,685,384	62.98	44.50
URUGUAY	0	1	1,788	930	520	3,429	41,309	3.38	24.50
MEAN VALUES									
FULL SAMPLE (n=540)	0.85	0.17	61,243	39,824	229,432	355,441	837,399	85.87	34.36
FATCA (n=460)	1.00	93.45	71,727	46,663	261,754	407,613	926,957	93.45	35.76
NON-FATCA (n=80)	0.00	42.27	960	500	3,831	10,916	322,439	42.27	26.30
Difference		51.18	70,767	46,163	257,923	396,697	604,518	51.18	9.46
Significance of difference		*	***	***	***	***	***	*	***

Notes: This table presents the mean values of the key variables by country. The 54 countries included in the sample are those for which ten full years of data (2006-2015) are available in the TIC data. Column (1), *FATCA Country*, is an indicator variable equal to one if the country has signed an Inter-Governmental Agreement (IGA) with the U.S. to exchange information as of 2015 (the end of the sample period), and zero otherwise. Column (2), *Haven Country*, is an indicator equal to one if the country was identified as a tax haven by Dyreng and Lindsey (2009), and zero otherwise. Column (3), *Mean U.S. Equity FPI*, is the average annual amount of long-term equity foreign portfolio investment (in \$millions) from the country into the U.S. as of December of each year. Column (4), *Mean U.S. Debt FPI*, is the average annual amount of corporate debt foreign portfolio investment (in \$millions) from the country into the U.S. as of December of each year. Column (5), *Mean WW Equity FPI*, is the average annual amount of long-term equity foreign portfolio investment (in \$millions) from the country into all countries as of December of each year. Column (6), *Mean WW Debt FPI*, is the average annual amount of corporate debt foreign portfolio investment (in \$millions) from the country into all countries as of December of each year. Column (7), *Country GDP*, is the average gross domestic product (in \$millions); Column (8), *Country Population*, is the average population (in millions). Column (9), *Tax Rate*, reports the average top statutory tax rate on individual income in the country. Average values of each variable for the full sample, as well as sub-samples of FATCA-signing and non-FATCA-signing countries, are presented at the bottom of the table. In the final row, ***, **, and * indicate that the mean values for the two sub-samples are statistically different at the 1%, 5%, and 10% confidence levels, respectively.

Table 2
Correlations of Key Variables

	<i>Log(Equity FPI)</i>	<i>Log(Debt FPI)</i>	<i>Log(WW Equity FPI)</i>	<i>Log(WW Debt FPI)</i>	<i>Log(GDP)</i>	<i>Log(Population)</i>	<i>Tax rate</i>	<i>Tax haven (0/1)</i>
<i>Log(Equity FPI)</i>	0.92*	0.82*	0.81*	0.39*	-0.13*	0.40*	0.23*	
<i>Log(Debt FPI)</i>	0.94*	0.79*	0.83*	0.34*	-0.16*	0.36*	0.24*	
<i>Log(WW Equity FPI)</i>	0.86*	0.82*	0.85*	0.37*	-0.19*	0.50*	-0.05	
<i>Log(WW Debt FPI)</i>	0.84*	0.86*	0.90*	0.27*	-0.29*	0.42*	0.09	
<i>Log(GDP)</i>	0.43*	0.39*	0.40*	0.38*	0.78*	0.55*	-0.51*	
<i>Log(Population)</i>	-0.12*	-0.14*	-0.16*	-0.16*	0.72*	0.29*	-0.61*	
<i>Tax rate</i>	0.47*	0.44*	0.56*	0.52*	0.47*	0.13*	-0.40*	
<i>Tax haven (0/1)</i>	0.23*	0.26*	-0.02	0.08	-0.44*	-0.59*	-0.35*	

Notes: This table reports correlations for the key dependent and control variables. Pearson coefficients are reported above the diagonal; Spearman coefficients below the diagonal. *Log(Equity FPI)* is the natural log of equity portfolio investment (in \$millions) into the U.S. (TIC). *Log(Debt FPI)* is the natural log of corporate debt portfolio investment (in \$millions) into the U.S. (TIC). *Log(WW Equity FPI)* is the natural log of equity portfolio investment (in \$millions) into all countries in the world (CPIS). *Log(WW Debt FPI)* is the natural log of debt portfolio investment (in \$millions) into all countries in the world (CPIS). *Log(GDP)* is the natural log of country-year gross domestic product (in \$millions), from The World Bank website. *Log(Population)* is the natural log of the country-year population, obtained from The World Bank website. *Local Rate* is the annual individual tax rate of each country, compiled from the University of Michigan, the OECD, KPMG, the Tax Foundation, and Trading Economics. *Haven Ind.* is an indicator variable equal to one if the country was identified as a tax haven by Dyreng and Lindsey (2009), or zero otherwise. * indicates statistical significance at the 5% level.

Table 3
U.S. Inbound Foreign Portfolio Investment

	<i>Log(Equity FPI)</i>		<i>Log(Debt FPI)</i>	
	FATCA	Non-signers	FATCA	Non-signers
	(1)	(2)	(3)	(4)
<i>Haven*Post_FATCA</i>	-0.252*** (0.087)	-0.120 (0.172)	0.322** (0.125)	-0.257 (0.344)
<i>Tax Rate</i>	0.003 (0.010)	0.009 (0.006)	0.005 (0.019)	-0.027** (0.010)
<i>Population</i>	0.445 (1.371)	-2.620*** (0.834)	-3.374 (3.190)	-10.775*** (3.016)
<i>GDP</i>	0.533** (0.247)	0.235 (0.379)	0.087 (0.354)	-0.654 (0.900)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	460	80	460	80
Adjusted R ²	0.983	0.949	0.949	0.896

Notes: This table reports results of testing the relation between the logarithm of inbound equity FPI to the U.S. in Columns (1) and (2) and inbound debt FPI to the U.S. in Columns (3) to (4) in the post-FATCA period from haven countries relative to non-haven countries. Columns (1) and (3) are estimated on the sub-sample of FATCA countries (i.e., countries that have signed an Intergovernmental Agreement with the U.S. to exchange information), and Columns (2) and (4) are estimated on the sub-sample of non-signers. *Haven* is an indicator variable equal to one if a country was identified as a tax haven by Dyreng and Lindsey (2009), or zero otherwise. *Post_FATCA* is an indicator variable equal to one for years 2012 and later, and zero otherwise. *Tax Rate* is the highest individual tax rate of each country, compiled from the University of Michigan, the OECD, KPMG, the Tax Foundation, and Trading Economics. *Log(Population)* is the natural log of the country-year population, and *Log(GDP)* is the natural log of country-year gross domestic product (in \$millions); both are obtained from The World Bank website. All specifications include country and year fixed effects. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively; standard errors are presented and are adjusted using the Newey-West procedure.

Table 4
U.S. Inbound Foreign Portfolio Investment by Haven Country

	<i>Log(Equity FPI)</i>		<i>Log(Debt FPI)</i>	
	FATCA	Non-signers	FATCA	Non-signers
	(1)	(2)	(3)	(4)
<i>Bahamas*Post_FATCA</i>	-0.499*** (0.124)		0.136 (0.235)	
<i>Bermuda*Post_FATCA</i>	-0.216 (0.134)		-0.033 (0.156)	
<i>Ireland*Post_FATCA</i>	0.209** (0.096)		0.389*** (0.130)	
<i>Luxembourg*Post_FATCA</i>	0.014 (0.124)		0.583** (0.275)	
<i>Panama*Post_FATCA</i>	-0.610*** (0.199)		0.386* (0.226)	
<i>Singapore*Post_FATCA</i>	-0.548*** (0.180)		0.859*** (0.298)	
<i>Switzerland*Post_FATCA</i>	-0.188*** (0.070)		0.107 (0.109)	
<i>Lebanon*Post_FATCA</i>		0.188 (0.182)		-0.599 (0.443)
<i>Uruguay*Post_FATCA</i>		-0.477*** (0.152)		0.140 (0.367)
<i>Tax Rate</i>	0.002 (0.011)	0.010 (0.007)	0.005 (0.020)	-0.028*** (0.010)
<i>Log(Population)</i>	0.683 (1.480)	-3.845*** (0.810)	-4.104 (3.582)	-9.412*** (3.496)
<i>Log(GDP)</i>	0.593** (0.261)	0.476 (0.403)	0.076 (0.378)	-0.922 (0.962)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	460	80	460	80
Adjusted R ²	0.983	0.952	0.949	0.896

Notes: This table reports results of testing the relation between the logarithm of inbound equity FPI to the U.S. in Columns (1) and (2) and inbound debt FPI to the U.S. in Columns (3) to (4) in the post-FATCA period from haven countries relative to non-haven countries. Separate indicator variables for each haven country replace the *Haven* indicator in Eq. (1). Columns (1) and (3) are estimated on the sub-sample of FATCA countries (i.e., countries that have signed an Intergovernmental Agreement with the U.S. to exchange information), and Columns (2) and (4) are estimated on the sub-sample of non-signers. *Post_FATCA* is an indicator variable equal to one for years 2012 and later, and zero otherwise. *Tax Rate* is the highest individual tax rate of each country, compiled from the University of Michigan, the OECD, KPMG, the Tax Foundation, and Trading Economics. *Log(Population)* is the natural log of the country-year population, and *Log(GDP)* is the natural log of country-year gross domestic product (in \$millions); both are obtained from The World Bank website. All specifications include country and year fixed effects. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively; standard errors are presented and are adjusted using the Newey-West procedure.

Table 5
U.S. Inbound Foreign Portfolio Investment: Falsification Tests

<i>Panel A: 2008 Falsification Tests</i>				
	<i>Log(Equity FPI)</i>		<i>Log(Debt FPI)</i>	
	FATCA	Non-signers	FATCA	Non-signers
	(1)	(2)	(3)	(4)
<i>Haven*Post_2008</i>	-0.202** (0.099)	0.246 (0.201)	-0.037 (0.228)	-0.882 (0.512)
<i>Tax Rate</i>	0.012 (0.016)	0.025 (0.016)	0.026 (0.032)	-0.021 (0.013)
<i>Population</i>	2.258 (2.598)	0.348 (4.221)	-2.010 (8.236)	-30.372*** (7.893)
<i>GDP</i>	0.706 (0.571)	-0.074 (0.413)	-0.242 (0.839)	1.457 (1.238)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	184	32	184	32
Adjusted R ²	0.987	0.958	0.952	0.941
<i>Panel B: 2010 Falsification Tests</i>				
	<i>Log(Equity FPI)</i>		<i>Log(Debt FPI)</i>	
	FATCA	Non-signers	FATCA	Non-signers
	(1)	(2)	(3)	(4)
<i>Haven*Post_2010</i>	-0.067 (0.070)	0.127 (0.185)	0.057 (0.183)	0.727 (0.621)
<i>Tax Rate</i>	-0.002 (0.009)	0.030 (0.026)	-0.004 (0.021)	-0.244 (0.155)
<i>Population</i>	-1.102 (3.336)	-3.284 (3.979)	-0.260 (7.729)	-2.662 (17.050)
<i>GDP</i>	-0.117 (0.331)	-0.612 (0.505)	-1.094* (0.658)	1.306 (1.679)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	184	32	184	32
Adjusted R ²	0.991	0.979	0.963	0.910

Notes: This table reports two falsification tests by testing the relationship between foreign portfolio investment into the U.S. from FATCA-signing countries and non-signing countries in years prior to 2012. In Panel A (B), the sample is restricted to the period 2006 to 2009 (2008 to 2011). The dependent variable is the logarithm of equity FPI in Columns (1) and (2) and the logarithm of debt FPI in Columns (3) and (4). Columns (1) and (3) are estimated on the sub-sample of FATCA countries (i.e., countries that have signed an Intergovernmental Agreement with the U.S. to exchange information), and Columns (2) and (4) are estimated on the sub-sample of non-signers. *Haven* is an indicator variable equal to one if the country was identified as a tax haven by Dyreng and Lindsey (2009), or zero otherwise. *Post_2008* (*Post_2010*) in Panel A (B) is an indicator variable equal to one for years 2008 and 2009 (2010 and 2011), and zero otherwise. *Tax Rate* is the highest individual tax rate of each country, compiled from the University of Michigan, the OECD, KPMG, the Tax Foundation, and Trading Economics. *Log(Population)* is the natural log of the country-year population, and *Log(GDP)* is the natural log of country-year gross domestic product (in \$millions); both are obtained from The World Bank website. All specifications include country and year fixed effects. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively; standard errors are adjusted using the Newey-West procedure.

Table 6
Worldwide Foreign Portfolio Investment
Panel A: Investment activity CPIS data

	<i>All countries</i>				<i>All countries except U.S.</i>			
	<i>Log(Equity FPI)</i>		<i>Log(Debt FPI)</i>		<i>Log(Equity FPI)</i>		<i>Log(Debt FPI)</i>	
	FATCA	Non-signers	FATCA	Non-signers	FATCA	Non-signers	FATCA	Non-signers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Haven*Post_FATCA</i>	-0.367*** (0.138)	0.293 (0.206)	-0.091 (0.077)	0.142 (0.180)	-0.302* (0.182)	0.924* (0.511)	-0.065 (0.091)	0.465 (0.301)
<i>Tax Rate</i>	-0.001 (0.007)	0.009 (0.024)	0.001 (0.006)	-0.007 (0.010)	0.004 (0.006)	0.021 (0.039)	-0.005 (0.007)	-0.009 (0.014)
<i>Log(Population)</i>	1.085 (1.131)	-3.453* (1.671)	0.006 (1.380)	-1.667** (0.688)	2.265* (1.283)	-4.590 (3.597)	-0.961 (1.380)	-2.464 (1.467)
<i>Log(GDP)</i>	1.469*** (0.271)	1.296** (0.564)	1.068*** (0.240)	-0.936*** (0.314)	1.049*** (0.360)	1.284 (1.119)	1.075*** (0.275)	-1.132** (0.439)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	370	40	370	40	370	40	370	40
Adjusted R ²	0.984	0.904	0.985	0.956	0.977	0.603	0.984	0.961

Panel B: Investment activity using Adjusted CPIS data

	<i>All countries</i>				<i>All countries except U.S.</i>			
	<i>Log(Equity FPI)</i>		<i>Log(Debt FPI)</i>		<i>Log(Equity FPI)</i>		<i>Log(Debt FPI)</i>	
	FATCA	Non-signers	FATCA	Non-signers	FATCA	Non-signers	FATCA	Non-signers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Haven*Post_FATCA</i>	-0.270** (0.123)	-0.150 (0.250)	-0.069 (0.072)	0.045 (0.211)	-0.295* (0.153)	0.073 (0.435)	-0.081 (0.077)	0.183 (0.233)
<i>Tax Rate</i>	-0.003 (0.007)	-0.005 (0.007)	0.002 (0.006)	-0.011 (0.009)	0.001 (0.006)	-0.009 (0.014)	-0.003 (0.007)	-0.015 (0.009)
<i>Log(Population)</i>	0.898 (1.066)	-2.715** (1.175)	0.394 (1.291)	-2.709** (1.276)	1.791 (1.151)	-2.087 (1.913)	-0.592 (1.255)	-2.927* (1.458)
<i>Log(GDP)</i>	1.217*** (0.252)	2.389*** (0.603)	1.073*** (0.206)	-0.570 (0.427)	0.932*** (0.323)	2.482*** (0.913)	1.100*** (0.229)	-0.602 (0.456)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	430	70	430	70	430	70	430	70
Adjusted R ²	0.983	0.935	0.985	0.889	0.978	0.883	0.985	0.920

Notes: This table reports the results of estimating Eq. (1) using data from the International Monetary Fund's Coordinated Portfolio Investment Surveys (CPIS); in Panel B, we adjust these data using the methodology from Zucman (2013a). In Columns (1) and (2) of Panel A (B), the dependent variable is the logarithm of the equity portfolio investment to all 243 (238) countries (including the U.S.). In Columns (3) and (4), the dependent variable is the logarithm of the debt portfolio investment to all countries (including the U.S.). Columns (1) and (3) are estimated on the sub-sample of FATCA countries (i.e., countries that have signed an Intergovernmental Agreement with the U.S. to exchange information), and Columns (2) and (4) are estimated on the sub-sample of non-signers. *Haven* is an indicator variable equal to one if the country was identified as a tax haven by Dyreng and Lindsey (2009), or zero otherwise. *Post_FATCA* is an indicator variable equal to one for years 2012 and later, and zero otherwise. *Tax Rate* is the annual individual tax rate of country, compiled from the University of Michigan, the OECD, KPMG, the Tax Foundation, and Trading Economics. *Log(Population)* is the natural log of the country-year population, and *Log(GDP)* is the natural log of country-year gross domestic product (in \$millions); both are obtained from The World Bank website. All specifications include country and year fixed effects. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively; standard errors are presented and are adjusted using the Newey-West procedure.

Table 7
Level of Hidden Assets

<i>Panel A: Descriptive Statistics</i>				
	Equity Gap		Debt Gap	
	(1)	(2)	(1)	(2)
<i>FATCA</i>	64,727	29,583		
<i>NON-FATCA</i>	7,385	2,669		
<i>Difference</i>	57,342	26,914		
<i>Significance of difference</i>	**	***		

<i>Panel B: Zucman (2013) Gap</i>				
	<i>Log(Equity GAP)</i>		<i>Log(Debt GAP)</i>	
	FATCA	Non-signers	FATCA	Non-signers
	(1)	(2)	(3)	(4)
<i>Haven*Post_FATCA</i>	-0.342*** (0.120)	0.001 (0.056)	-0.484 (0.457)	-0.006 (0.058)
<i>Tax Rate</i>	-0.015 (0.011)	0.001 (0.002)	-0.010 (0.009)	-0.002 (0.002)
<i>Population</i>	-2.161 (1.676)	0.881 (0.872)	-0.940 (2.636)	0.659 (0.683)
<i>GDP</i>	0.793*** (0.301)	0.219 (0.235)	-0.057 (0.186)	0.276 (0.302)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	406	80	406	80
Adjusted R ²	0.648	0.932	0.637	0.717

Notes: This table reports the results of estimating Eq. (1) using the amount of hidden assets in a particular country, estimated following the methodology in Zucman (2013a). Panel A reports the means of the gaps (the difference between the amount of reported equity or debt holdings by the investment country and the amount of reported equity or debt holdings by the investee country) for the FATCA and Non-FATCA subsamples. Panel B reports the results of estimating Eq. (1) with the log of the gap as the dependent variable. To mitigate the effects of extreme outliers in the distribution of gaps, we truncate the sample at 5% and 95%. In addition, because the calculated gaps can be positive or negative, in order to use the logarithmic transformation, we first add the minimum value of the variable to all observations. In Columns (1) and (2), the dependent variable is the log of the gap in equity holdings; in Columns (3) and (4), the dependent variable is the logarithm of the gap in debt holdings. Columns (1) and (3) are estimated on the sub-sample of FATCA countries (i.e., countries that have signed an Intergovernmental Agreement with the U.S. to exchange information), and Columns (2) and (4) are estimated on the sub-sample of non-signers. *Haven* is an indicator variable equal to one if the country was identified as a tax haven by Dyreng and Lindsey (2009), or zero otherwise. *Post_FATCA* is an indicator variable equal to one for years 2012 and later, and zero otherwise. *Tax Rate* is the annual individual tax rate of each country, compiled from the University of Michigan, the OECD, KPMG, the Tax Foundation, and Trading Economics. *Log(Population)* is the natural log of the country-year population, and *Log(GDP)* is the natural log of country-year gross domestic product (in \$millions); both are obtained from The World Bank website. All specifications include country and year fixed effects. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively; standard errors are presented and are adjusted using the Newey-West procedure.