

## Taking the Long Way Home: U.S. Tax Evasion and Offshore Investments in U.S. Equity and Debt Markets

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### ABSTRACT

We empirically investigate one form of illegal investor-level tax evasion and its effect on foreign portfolio investment. In particular, we examine a form of round-tripping tax evasion in which U.S. individuals hide funds in entities located in offshore tax havens and then invest those funds in U.S. securities markets. Employing Becker's (1968) economic theory of crime, we identify the tax evasion component in foreign portfolio investment data by examining how foreign portfolio investment varies with changes in the incentives to evade and the risks of detection. To our knowledge, this is the first empirical evidence of investor-level tax evasion affecting cross-border investment in equity and debt markets.

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While taxes have played an important part in the finance literature for decades, the focus to date has been almost exclusively on the implications of the tax laws as legally applied. The effects of tax evasion – the illegal reduction of taxes – on financial decisions have gone largely unexplored. In this paper, we investigate one form of investor-level tax evasion and its effect on foreign portfolio investment (FPI). Specifically, we empirically examine a method of offshore tax evasion we call “round-tripping,” in which U.S. individuals hide funds in tax haven entities and then reinvest those funds in U.S. stocks and bonds. By making it appear that the investments are coming from true foreign investors, the individuals are able to evade most tax on the investment income because the U.S. taxes foreign investors in U.S. securities much more favorably than domestic investors.<sup>1</sup>

The U.S. Senate Permanent Subcommittee on Investigations stressed the importance of obtaining empirical evidence about offshore tax evasion, writing “Offshore tax havens today hold trillions of dollars in assets provided by citizens of other countries, including the United States. The extent to which those assets represent funds hidden from tax authorities...is of critical importance” (U.S. Senate Permanent Subcommittee on Investigations, 2008).<sup>2</sup> However, other than anecdotal evidence from cases where tax evaders have been caught, there is essentially no systematic evidence of the effects of tax evasion on FPI. The lack of empirical evidence is due, no doubt, to the nature of tax evasion as an illegal activity shrouded in secrecy. The very factors that protect the tax evader (i.e., bank secrecy laws and lack of information sharing with the tax authorities of other nations) also make it difficult for researchers to study offshore tax evasion. Consequently, despite decades of concern by governments as well as efforts to curtail such evasion, there is little empirical evidence about offshore tax evasion and none about its effects on international portfolio investment. Equally unknown is the behavioral

response of tax evaders to changes in tax rates and enforcement over time. The purpose of this study is to provide initial evidence on these issues.

Our empirical analysis takes advantage of inbound portfolio investment data (from both havens and non-havens) collected by the Federal Reserve and the U.S. Treasury. FPI is defined as foreign investment of less than 10% ownership of a corporation. In our sample, FPI in U.S. debt and equities totaled approximately \$3.4 trillion in 2008, of which approximately \$1.2 trillion came from tax havens.<sup>3</sup> It is important to note that much of the FPI has nothing to do with tax evasion and is simply the result of investment decisions and portfolio allocations, largely to and from our major trading partners, such as Canada, the U.K., and Japan. Even where FPI travels through tax havens, in many cases it could be for non-evasion reasons, including regulatory reasons and legal tax avoidance.

Our identification strategy applies the economic theory of crime pioneered by Becker (1968) and extended to the realm of tax evasion by Allingham and Sandmo (1972) and others (see Slemrod (2007)). Specifically, would-be tax evaders face a tension between the expected tax savings from engaging in tax evasion and the expected costs. In order to separate evasion-related FPI from FPI that takes place for other (legal and illegal) reasons, we employ measures of the benefits and costs of evasion that are unlikely to be related to other motivations for FPI. Our measures of the benefits of evading U.S. tax are the U.S. ordinary and capital gains tax rates over time. In periods when taxes on capital gains and interest income are high, there are more benefits from evading U.S. tax on portfolio investment. Using U.S. ordinary and capital gains tax rates helps in the identification of U.S. tax evasion because U.S. investors are subject to those taxes but foreign investors in U.S. securities generally are not.<sup>4</sup> If U.S. investors are disguising themselves as foreign investors, then we expect to see more FPI into the U.S. when U.S. capital

gains and ordinary tax rates increase. We expect this effect to be greater for FPI from tax haven nations relative to non-haven nations because tax evaders will be attracted to low-tax foreign jurisdictions.<sup>5</sup>

We measure the risk of getting caught using enforcement efforts that vary over time and across countries. We examine two major sets of changes in enforcement: the enactment of bilateral Tax Information Exchange Agreements (TIEAs) between the U.S. and certain tax havens, and Organisation for Economic Co-operation and Development (OECD) actions that increased the focus on tax haven nations. Bilateral information sharing agreements between the U.S. and a tax haven increase the risk of detection for U.S. tax evaders, but should not affect “true” foreign investors. We also test the OECD dates, which are not U.S.-specific but are more general indications of greater enforcement on tax evasion transactions. Our tests control for other factors associated with FPI, including time fixed effects, country fixed effects, and time-varying country-specific effects (e.g., local tax rates, GDP, population, communications infrastructure, and exchange rates). In addition, we conduct a battery of robustness tests, including tests that control for investing activity of pensions and hedge funds that often occurs in tax havens but is unrelated to round-tripping.

We report two main findings. First, increases in U.S. ordinary and capital gains tax rates are associated with increases in inbound FPI from haven countries. These results are consistent with a portion of the inbound portfolio investment from tax havens actually being from U.S. tax evaders, rather than “true” foreign investors. We estimate that a 1% increase in the top U.S. ordinary tax rate results in an approximate 2.1% to 2.8% increase in inbound equity FPI from tax havens relative to non-havens, depending on the specification. Thus, the effect of round-tripping tax evasion on FPI is economically meaningful. Second, we find that engaging in information

sharing agreements with tax havens decreases inbound portfolio investment from those havens. Specifically, we estimate that engaging in a TIEA with a tax haven results in a decrease in inbound equity FPI from those tax havens ranging from 20.6% to 32.6%, and a decrease in debt FPI ranging from zero to 32.5%, depending on the specification. To our knowledge, these are the first large-sample empirical estimates of investor-level tax evasion affecting cross-border investment in debt and equity securities.<sup>6</sup>

A variety of other economic magnitudes can be estimated from the results, including the estimated effects of TIEAs and the estimated lost U.S. tax revenue. During our sample period, the U.S. entered into four information exchange agreements with tax havens, but many tax havens still do not have TIEAs with the U.S. As of 2008, tax havens in our sample without TIEA agreements accounted for approximately \$337 billion of inbound FPI to the U.S. Applying the range of estimates from the TIEA tests to the remaining tax havens suggests that approximately \$34 billion to \$109 billion of FPI from those tax havens may be due to round-tripping tax evasion. The estimated tax revenue lost due to such evasion requires additional assumptions and can be thought of in two parts. One, if the funds transferred offshore were from income that was never declared to the tax authorities, it would be reasonable to estimate a tax revenue loss of \$8 billion to \$27 billion. Two, there is ongoing annual tax revenue lost from not reporting the income on the investments. A reasonable estimate of the expected annual tax evaded on this investment income is on the order of \$1 billion to \$2 billion.<sup>7</sup> It is important to keep in mind that these are not designed to be overall estimates of cross-border tax evasion. Our estimates only include round-tripping tax evasion taking place through tax havens in our sample that have not signed TIEAs with the U.S. While these magnitudes should be interpreted with an appropriate amount of caution, they lead to at least two implications. First, cross-border tax evasion plays an

important but not well-understood role in international finance by influencing the amount and location of portfolio investment. Second, policymakers may find increases in information exchange and enforcement a fruitful area for improving tax compliance, particularly given the anticipated future tax revenue needs to reduce deficits.

Our paper contributes to the literature on the effects of taxation on financial decisions, particularly cross-border taxation on equity markets. Even with the rising importance of FPI, the taxation of foreign portfolio income has largely been ignored until recently (Graetz and Grinberg (2003)). The literature on cross-border taxation and equity markets has examined topics such as dividend tax arbitrage (McDonald (2001)), tax effects on ex-day behavior of ADR securities (Callaghan and Barry (2003)), the effects of dividend taxation on FPI (Amiram and Frank (2010)), the effect on worldwide portfolio allocation surrounding the Jobs and Growth Tax Relief Reconciliation Act (Desai and Dharmapala (2011)), and effects of changes in the corporate taxation of foreign earnings on dividend payout and share repurchases (Dharmapala, Foley, and Forbes (2011)). While these papers advance our understanding of the effects of taxation in international portfolio investment, none of these papers examines the effects of tax evasion. The literature is silent when it comes to evidence on cross-border tax evasion in equity or debt markets (or, for that matter, evasion in derivatives, commodities, or real asset markets).

There have been two review papers that discuss the relevant issues. Dharmapala (2009) reviews the literature surrounding tax havens and of tax haven activities in terms of both corporate and individual investor tax planning.<sup>8</sup> Gravelle (2009) also provides a review of international tax avoidance and discusses individual tax evasion and the legislative attempts to curtail such evasion. Overall, these papers provide valuable summaries of the literature and

discussion of the issues, but neither is intended to provide an empirical investigation of tax evasion and examination of the effects of tax evasion on FPI. This is what we do in our paper.

In terms of the broader literature on tax aggressiveness, Graham and Tucker (2006), Hanlon and Slemrod (2009), Lisowsky (2010), and others examine corporations engaging in tax shelters and the related effects. Our paper also examines tax-aggressive behavior but is different from these papers in at least two respects. First, our paper provides evidence on tax evasion, an illegal activity that is beyond aggressive, but legal, tax strategies evaluated in prior research. Second, our paper provides evidence on investor-level behavior rather than corporate-level behavior. In that sense, our paper also contributes to the growing literature in personal finance. The typical paper in that field examines the factors that influence household portfolio choices. Some studies consider the influence of taxation on investment decisions, but even these say little about the possibility of tax evasion, and more directly, how incentives for tax evasion influence the average investor's investment decisions. Our evidence is consistent with tax evasion playing a significant role in the timing, method, and extent of investments into domestic securities. Although it is not surprising that some offshore tax evasion occurs, there is no large scale evidence of its effects or its determinants. Thus, we provide new insights into an important factor in household investment decisions. Finally, the results have implications for the home-bias literature, suggesting that home-bias is stronger than previously determined from the data, because some of what appears to be foreign investment is actually coming from domestic investors evading taxes.

The paper proceeds as follows. In Section I we briefly describe how offshore tax evasion takes place and the laws and efforts to prevent it. In Section II we develop our hypotheses and in

Section III we describe our research design. Section IV presents our empirical analysis and Section V concludes.

## **I. Background and Institutional Details**

### *A. Offshore tax evasion and round-tripping*

This section briefly describes how individuals actually evade taxes with offshore round-tripping transactions. A simple hypothetical can illustrate the key aspects of offshore tax evasion via round-tripping. A U.S. individual sets up a foreign corporation, in Bermuda for example, and opens a bank account, also in Bermuda, in the name of the corporation. All this can be done over the Internet for a small fee. The individual transfers funds to the bank account of the Bermuda corporation and has the Bermuda corporation make investments in the U.S. and other countries.<sup>9</sup> Because the account is in Bermuda where tax rates are zero, the person pays no local taxes on the income attributable to the account.

Moreover, an individual engaging in such a scheme can save a great deal of U.S. taxes. By disguising the investment as being from a foreign corporation or nonresident alien, taxes on interest income and trading gains are not paid because foreign corporations (not controlled by U.S. persons) and nonresident alien individuals are generally not subject to U.S. income tax on the interest and capital gains income from the U.S. stock and bond investments. Once the individual has gone down the path of tax evasion, the true taxes due are likely never to be paid other than through discovery or initiatives by the tax authorities. Individuals have devised a number of ways to eventually access the offshore funds without declaring them, including access through credit cards and ATMs in the U.S. or abroad, gift cards, prepaid cards, smuggling the cash or assets into the U.S., or simply spending the funds outside the U.S.<sup>10</sup> The U.S. will, however, collect a withholding tax on any *dividend income* paid to foreign investors, including



foreign corporations created by U.S. individuals for round-tripping. The default dividend withholding tax rate is 30%.

*B. Lack of information and efforts to detect and prevent offshore tax evasion*

Offshore tax havens have historically thrived on secrecy. Detection of offshore tax evasion is difficult because the U.S. relies largely on self-reporting and does not require withholding taxes on most interest income and capital gains. Even if the authorities learn of the existence of an offshore entity, the process to obtain information about the owners of the entity is difficult and time consuming. In addition, audits involving offshore tax evasion are more challenging, require highly trained IRS agents, and take longer to conduct.

Arguably the most visible initiative against tax havens was undertaken by the OECD. The OECD mounted an anti-tax haven effort starting in 1998, when it established a working group to focus on “harmful tax practices” (OECD (1998)). In 2000, the OECD issued a report that listed 35 jurisdictions as tax havens, pressured the tax havens to adopt certain practices of cooperation and transparency, and warned that countries that did not cooperate would be placed on a list of uncooperative tax havens. In 2001, the pressure on havens increased, as the OECD established a group to develop new standards for effective information exchange, met with officials from each of the tax havens to discuss conditions for removal from the list, and established when coordinated defensive measures could be taken against uncooperative tax havens.

Over time countries were removed from the blacklist as they agreed to OECD reforms, including entering into a sufficient number of TIEAs (described below) with other countries. By 2002, 31 of the countries had agreed to cooperate with the OECD, though implementation in some cases took much longer. By April 2009, there were no countries on the OECD blacklist and

only four countries on the grey list (Costa Rica, Malaysia, the Philippines, and Uruguay) and those were labeled as “other financial centers” rather than tax havens.

In large part due to the OECD efforts, there has been a significant increase in the number of TIEAs between the U.S. and countries that were identified as tax havens. In general, TIEAs provide for sharing of tax information between the countries to assist in tax enforcement. Although TIEAs represent a step forward, TIEAs have many major limitations, foremost of which is that the information exchange usually only takes place upon request, which is difficult without information about who is avoiding tax in the first place. A second major limitation is that bank secrecy laws in the foreign country are unaffected by the TIEA. A third limitation is that the tax haven country might not have useful information to share. For example, the British Virgin Islands has hundreds of thousands of registered corporations but the country requires neither identification of shareholders or directors nor any financial records (Sullivan (2009)). Thus, an information request to the British Virgin Islands may not yield much usable information because the information is not even collected by the tax haven. On the other hand, even a small chance of detection may be enough to drive away would-be tax evaders. Indeed, a 2007 guide to tax havens advises people interested in confidentiality to avoid tax havens that have signed TIEAs stating “...you should not do business with a TIEA tax haven...this device has undermined once good tax havens” (Barber (2007; p. 127)). Thus, while some commentators are skeptical of the effectiveness of TIEAs (e.g., Sheppard (2009); Kudrle (2008)), TIEAs may have an effect in practice.

Although efforts to curtail offshore tax evasion have increased in recent years, historically the perception has been that enforcement efforts with regard to offshore tax evasion have been weak. Lax enforcement may be efficient if the costs of increasing enforcement would exceed the

benefits (Slemrod (2007)). However, because little is known about the magnitude of offshore tax evasion, it is impossible to know whether this is the case. Our study provides initial evidence about one type of offshore tax evasion – its existence, its magnitude, and its effect on portfolio investment – in an effort to begin to inform the debate.

## **II. Hypotheses**

Our hypotheses are based on the economic theory of crime pioneered by Becker (1968) and extended to the realm of tax evasion by Allingham and Sandmo (1972) and others (see Slemrod (2007)). Under the economic theory of crime, would-be tax evaders optimize their tax evasion based on the marginal benefits and marginal costs of evasion. Tax evaders thus face a tension between the expected tax savings from engaging in tax evasion and the expected costs, which can include fines, penalties, and prison sentences. In our setting, we can observe shifts in both the benefits and the expected costs of tax evasion, and as a result, we make two predictions. Our first prediction focuses on the expected benefits of engaging in offshore tax evasion. As U.S. tax rates increase, the incentives also increase for U.S. citizens and residents to evade taxes by round-tripping their investments through foreign entities in tax havens. However, increases in U.S. tax rates should have no effect on true foreign investors, as they generally are not subject to U.S. taxes (other than withholding taxes). Thus, our first hypothesis is that FPI into the U.S. from tax havens is increasing in U.S. tax rates.

*H1: Foreign portfolio investment into the U.S. from tax havens is increasing in U.S. tax rates.*

If the data are consistent with our first hypothesis, it will provide evidence that offshore round-tripping occurs and that such offshore round-tripping tax evasion affects foreign investment in U.S. debt and equity securities.

Our second hypothesis focuses on shifts in the expected costs of tax evasion, primarily shifts in the probability of being discovered by the tax authorities. We examine several shifts in the likelihood of detection, all of which are events that signal increased efforts at stopping tax evasion through tax havens. The first events are the enactment of TIEAs between the U.S. and individual tax havens. The second events are increases in scrutiny of tax havens by the OECD in 1998 and 2001, as discussed above. We use these event dates as proxies for an increase in the expected likelihood of detection (i.e., the expected costs). We predict that the reduction in the secrecy afforded to would-be tax evaders has a negative effect on the amount of FPI into the U.S. from a tax haven.

*H2: Foreign portfolio investment into the U.S. from tax havens is decreasing in information-sharing initiatives with tax havens.*

Similar to our H1, if the data are consistent with H2, it will provide joint evidence that offshore round-tripping occurs and that such offshore round-tripping tax evasion affects FPI.

### **III. Research Design**

#### *A. Test of the effect of U.S. tax rates on FPI (Hypothesis 1)*

Our first empirical specification tests the effect of greater incentives to evade U.S. taxation, where the incentives to evade are measured by the U.S. tax rate. Again, the intuition behind the identification strategy is that U.S. tax rates only affect U.S. taxpayers – investors from other countries should be indifferent to changes in tax rates to which they are not subject. Thus, if changes in haven-sourced FPI into the U.S. vary with changes in the U.S. tax rate, this variation can be attributed to evasion by U.S. tax payers. As a result, we estimate the following equation:

$$\text{Log}(FPI_{i,t}) = \alpha_{country} + \alpha_{year-month} + \beta_1 HAVEN_i * TAXRATE_t + \gamma_K Controls_{i,t} + \varepsilon_{i,t}. \quad (1)$$

We examine both equity and debt FPI.  $\text{Log}(FPI_{i,t})$  in equity (debt) securities is the natural log of the market value of monthly foreign holdings of U.S. stocks (U.S. corporate bonds) from country  $i$  as of year-month  $t$ . These data are gathered from the Federal Reserve Board and are described in detail below.  $HAVEN_i$  is an indicator variable set equal to one if country  $i$  is identified as a tax haven and set to zero otherwise. We follow Dharmapala (2009) and define a country as a tax haven if it was listed on the 1998 OECD report on tax havens or if it was included in the list provided by Hines and Rice (1994) (see Table I for our classification).

We include time fixed effects ( $\alpha_{year-month}$ ) for each year-month to control for time-varying changes in FPI. For example, the time fixed effects account for changes in the level of the U.S. capital markets across time (at the monthly level), which is equivalent to including a control for the monthly level of the S&P 500 index. We include country fixed effects ( $\alpha_{country}$ ) to control for FPI that is due to stationary characteristics of the country, such as language, distance, weather, legal origin, etc.<sup>11</sup> As noted in Christensen, Hail, and Leuz (2011), the extensive structure of the country and time fixed effects is very demanding and could capture some of the treatment effect of changes in regulatory enforcement, in our case, signing of TIEAs or increased OECD scrutiny. Main effects for  $HAVEN$  or  $TAXRATE$  are also captured by the country and year-month fixed effects. We predict a positive coefficient on the  $HAVEN_i * TAXRATE_t$  interaction variable because as U.S. tax rates on U.S. investment increase, the incentives to evade the taxes via a tax haven increase.

We examine two measures of  $TAXRATE_t$ :  $LTCG\ RATE$  is the U.S. tax rate at time  $t$  applicable to long-term capital gains;  $ORD\ RATE$  is the top statutory U.S. ordinary income tax rate applicable at time  $t$  to ordinary income (e.g., interest income and short-term capital gains). We test the effect of the ordinary tax rate and the long-term capital gains rates on both debt and

equity FPI. It is important to note that the tax rates represent the tax avoided by the tax evader. For example, the ordinary tax rate applies to interest income from debt securities owned by U.S. investors (with no evasion). The ordinary tax rate also applies to short-term capital gains that a U.S. investor earns; thus, any rapid trading of securities is subject to such a rate. The long-term capital gains tax rate applies to gains from the sale of stocks or bonds held in excess of 12 months for most of our sample period. These are the taxes evaded by going offshore.<sup>12</sup> Thus, if tax evasion is occurring in a manner described above (i.e., round-tripping), then as U.S. tax rates increase, the benefits of avoidance increase, and FPI from haven locations should increase. We expect the increase to be in haven locations and not non-haven locations because the tax evader will owe little to no tax in a haven country.<sup>13</sup>

In addition to the time and country fixed effects, we control for five potential determinants of portfolio investment into the U.S: GDP, population, local tax rates, phone coverage, and foreign exchange rates. Country-specific variables are difficult to obtain for small countries such as tax havens, thus we include these particular variables both because of coverage and for their ability to proxy for the typical drivers of foreign investment. Following Desai and Dharmapala (2011), we include the log of country  $i$ 's gross domestic product in year  $t$ ,  $LOGGDP$ , and the log of the country  $i$ 's population in year  $t$ ,  $LOGPOP$ . We obtain GDP data from the World Bank database and population data from the United Nations database.<sup>14</sup> When the data are not available at these sources, we obtain the data from the International Monetary Fund and the CIA World Factbook database.<sup>15</sup> We also include annual tax rates from the country of origin,  $LOCAL TAX RATE$ , which are obtained from the OECD, the World Tax Database and KPMG.<sup>16</sup> We also include the interaction,  $HAVEN*LOCAL TAX RATE$ , to account for the potential confounding effect that U.S. tax rates and home country tax rates move in tandem. We

include phone coverage, *LOG PHONE*, as a proxy for technological development; *LOG PHONE* is measured as the natural log of the annual number of fixed-telephone subscriptions per 100 inhabitants, as reported by the United Nations database. Finally, we include annual foreign exchange rates from Compustat, *EXCH RATE*, to account for the effect of country-specific currency fluctuations on FPI.<sup>17</sup>

*B. Test of the effect of increases in expected probability of detection on FPI (Hypothesis 2)*

Our second hypothesis predicts that as the likelihood of detection increases, the level of FPI into the U.S. through offshore havens should decrease if any of the FPI is due to U.S. tax evasion. As our proxy of increased probability of detection, we use two sets of event dates associated with increased scrutiny of tax havens and employ interrupted time-series and difference-in-differences tests to examine the variation in FPI through havens versus non-havens following these events. The model is as follows:

$$\text{Log}(FPI_{i,t}) = \alpha_{country} + \alpha_{year-month} + \beta_1 HAVEN_i * POST_t + \gamma_k Controls_{i,t} + \varepsilon_{i,t}. \quad (2)$$

Depending on the specification, *POST* takes on a value of one for the time period after each of the two events: the signing of TIEAs with the U.S or the initiation of OECD enforcement actions. For TIEAs, the event is the month and year in which the U.S. signed a tax information sharing agreement with a particular country (*POSTCONTRACT*) and the year-month in which the agreement went into effect (*POSTEFFECTIVE*). In this test, the year-month of *POST* is specific to, and varies by, the country from which the FPI originates. Most of the countries in the sample, including several tax haven countries, have never signed TIEAs with the U.S., which results in a *POST* variable that is always zero for those countries.<sup>18</sup>

For the OECD scrutiny, we create indicator variables for the two years during which the OECD announced it would increase enforcement of tax avoidance via tax havens (*POST1998*

and *POST2001*), where *POST* is set to one after 1998 (and separately after 2001) and zero before those years. Similar to equation (1), we include time and country fixed effects to control for country and time factors, as well as controls for GDP, population, local tax rates, phone coverage, and foreign exchange rates.

Overall, if the increase in enforcement from these events increases the expected likelihood of detection (i.e., the agreements are effective) and tax evasion is occurring in our data, then inbound FPI should decrease after the signing of the agreement or after its effective date (as long as the increased costs become greater than the benefits for some of the investors). In the regression, a negative coefficient on the *POST* variables for the haven locations, relative to non-haven locations, is consistent with investment from the haven countries declining after tax evasion becomes more costly. Finally, we estimate a model that includes both the effects of TIEA enforcement and the effects of tax rate changes (costs and benefits) on FPI from havens versus non-havens.

Several caveats with respect to these tests are in order. First, to the extent that the OECD announcements of greater scrutiny and the tax information sharing agreements are ineffective, we do not expect any decrease in evasion activities. In other words, unless these events credibly increase expected costs of evasion, there will not be an effect on the extent of tax haven use to evade taxes. Second, these tests are interrupted time series tests that are susceptible to confounding events problems. If other factors that affect the level of FPI occur at roughly the same time and cause FPI from tax havens to decline (i.e., change in the same direction as an increase in tax authority scrutiny) more than non-havens, then we could attribute the observed behavior in the pattern of FPI from tax havens to tax evasion by U.S. individuals when it is really attributable to something else. Similarly, if there is a time trend that operates in the same



direction as our tests predict and it is specific to the tax havens affected by the enforcement activities, then it is possible that we pick up that trend. In addition, we cannot effectively control for changes in enforcement by other countries, and some of what we detect could be from foreign tax evasion. Of some comfort is that all of our events increase enforcement, which would yield decreasing investment. The time trend in FPI, in contrast, is generally increasing. Thus, the general time trend is, at least from this aspect, not a concern. In addition, our research design compares tax haven locations to non-haven locations, which is important because it isolates the effect attributable to the tax haven nature of the country and the resulting ability to accomplish tax evasion. In our robustness section below, we attempt to rule out as many of the above problems as possible, but to the extent we cannot, our results should be interpreted with care.

#### **IV. Empirical Analysis**

##### *A. Data and sample*

Our primary source of data is monthly estimates of U.S. securities positions held by foreign investors, as reported by the Federal Reserve Board (FRB), following Curcuro, Thomas, Warnock, and Wongswan (2011). These data are based on periodic surveys of foreign holdings of U.S. securities that occurred, until recently, only once every five years. They are now reported annually. However, foreign portfolio flows (as opposed to levels) are reported on a monthly basis. Thus, to arrive at a more frequent measure of levels of FPI, the FRB combines annual survey data of securities positions released by the U.S. Treasury International Capital System (TIC) with monthly transaction data released by the Treasury. That is, the annual level of FPI is combined with the monthly flow of FPI to arrive at a monthly level of FPI. The annual data from TIC are based on surveys of U.S.-based banks, broker-dealers, and financial institutions that have custody of U.S. equities and debt held by foreigners. Fulfilling the survey requirements by

U.S. custodians is mandatory under the International Investment and Trade in Services Survey Act, with severe penalties attached for failure to comply.<sup>19</sup> As a result, the annual levels data are considered reliable and have been used extensively in recent research examining international portfolio investment (e.g., Desai and Dharmapala (2011); Thomas, Warnock, and Wongswan (2006)). The monthly transaction data from the Treasury are based on a mandatory, monthly TIC survey filed by U.S. banks, securities dealers, and other entities.<sup>20</sup> Respondents to the surveys report the amount of transactions of four types of U.S. securities held by foreigners: equity, debt issued by U.S. corporations, U.S. Treasury debt, and U.S. government agency debt.<sup>21</sup> We focus our analysis on foreign holdings of U.S. equity and corporate debt because these are more likely to be held by individual investors, whereas U.S. Treasury and U.S. agency debt are often held by foreign governments.

In sum, the FRB combines low frequency data detailing the positions of foreigners in U.S. securities with high frequency transactions data. These data provide a monthly time series of estimated levels of foreign holdings of U.S. corporate bonds, U.S. equity securities, U.S. agency bonds, and U.S. Treasury bonds for about 80 countries over the time period 1984 to 2008. The data are available to the public on a website hosted by the FRB.<sup>22</sup> Because of the corrections to the well-known biases in international portfolio flow data (e.g., financial center bias), the long time series and the broad cross section of countries covered, the FRB estimates of monthly positions of foreign investors in U.S. equity and debt securities represent the best available data on portfolio holdings.<sup>23</sup>

Bertaut and Tryon (2007) describe a potential bias in the data called the “custodial bias,” in which the origin of the FPI is in question. This bias, which has long been recognized in the literature, arises because investors often use foreign banks to maintain custody of their shares in

countries other than their own. Thus, the investments in U.S securities by a U.S. investor with equities in custody at a Bermudan bank would be attributed to Bermuda rather than U.S. In our study, we *exploit* custodial bias by examining how investors sourced to havens react to changes in U.S. tax law; the portion that is sensitive to U.S. tax law and enforcement changes we interpret as being sourced to U.S. investors evading the U.S. income tax.

We make two adjustments to the data. First, we remove observations not clearly associated with a particular country. Specifically, we exclude observations from country groups reported in the FRB dataset, such as “African Oil Exporters” and “Other Europe,” and exclude countries that are grouped together where one is a haven and the other is not, such as Belgium and Luxembourg. Second, we exclude observations with insufficient data for our control variables.

### *B. Descriptive statistics*

Table I provides descriptive statistics of our variables for each country from which the inbound (to the U.S.) FPI is sourced. Specifically, for each country in our dataset, the table shows whether the country is a *HAVEN* in our study (1 = yes), the mean monthly equity FPI from the country over our sample period (1984 to 2008), the mean monthly debt FPI over our sample period, the mean population of the country over the sample period, and the mean GDP of the country during our sample period. Of the 59 countries for which we have data, 12 are tax haven countries. The United Kingdom has the highest level of equity FPI inbound into the U.S. in the sample, with Ghana exhibiting the lowest. China is the most populous country in the sample, while the Cayman Islands is the least populous country in the sample. Japan has the highest average GDP, while Liberia has the lowest average GDP. Hence, the sample exhibits

considerable cross-sectional variation in all of our variables of interest. Panel B of Table I presents the U.S. individual tax rates in effect over our sample years.

In Figure 1, we present a graph of the log of the average ratio of equity FPI to the population of the country, with haven countries identified as darkly shaded bars. Figure 2 reports the unscaled dollar amount of equity FPI from each of the countries in our sample as of 2008. Predictably, countries with large economies and trade with the United States occupy many of the top positions in terms of equity FPI into the United States, such as the United Kingdom, Canada, and Japan. In both figures, the disproportionate amount of investment coming from tax havens is clear. For example, in Figure 1, we see that the Cayman Islands and Bermuda occupy the top two positions, having the greatest amounts of FPI into the U.S. relative to their populations.

These descriptive statistics are not evidence of tax evasion, however, since there can be both regulatory reasons and legal tax avoidance reasons for investment through tax havens (e.g., Guttentag and Avi-Yonah (2005)). For example, the Cayman Islands is the location of choice for hedge funds. International Financial Services London (2010) reports that the Cayman Islands accounts for 39% of global hedge funds.<sup>24</sup> In addition, Bandopadhyaya and Grant (2007) document similar results showing that 38% of all offshore funds are in the Cayman Islands, while other tax havens play a much smaller role in hedge funds, with 8% in the British Virgin Islands and 6% in Bermuda. Other sources document that the Cayman Islands have strong regulatory structures in place to assure investors that the managers of the offshore funds are legitimate. To mitigate concerns that our tests are somehow picking up investing by Cayman Island hedge funds rather than illegal tax evasion via round-tripping, we exclude the Cayman Islands from our regressions, though the primary results are robust to including or excluding the Cayman Islands, as reported in the Internet Appendix.

*C. Test of Hypothesis 1: The effect of U.S. tax rates on inbound FPI*

Table II presents the results from estimating equation (1) for equity FPI (columns 1-4) and debt FPI (columns 5-8). All specifications include unreported controls for country and year-month fixed effects and all are estimated using Prais-Winsten (1954) standard errors for panel data.<sup>25</sup> Across all columns, the data reveal that the amount of equity FPI into the U.S. from haven locations varies positively with the U.S. ordinary income tax rates. Specifically, the coefficient on *HAVEN\*ORD RATE* is positive and significant across each of the specifications, ranging from 0.023 to 0.039. The coefficient on the interaction *HAVEN\*LT CG RATE* is positive and significant across each of the specifications, with coefficients ranging from 0.015 to 0.043. These results are consistent with the prediction in Hypothesis 1 that a higher U.S. tax rate is associated with greater FPI from tax havens relative to non-havens. We interpret the results as evidence of tax evasion by U.S. individuals via haven locations and with the evasion increasing as the benefits increase (i.e., as the tax evaded increases). The economic magnitudes are meaningful, in that a 1% increase in ordinary tax rates in the U.S. is associated with an approximate 2.6% to 3.6% greater increase in equity FPI and a 2.3% to 3.9% greater increase in debt FPI, depending on the specification, from tax havens relative to non-havens.

*D. Test of Hypothesis 2: The effect of an increase in detection risk on FPI*

Table III presents regression results from our estimation of equation (2). Panel A presents the results in which increased enforcement is measured as the signing of a TIEA (*POSTCONTRACT*). Across each of the specifications, the coefficient on the interaction term, *HAVEN\*POSTCONTRACT*, is negative and significant. Specifically, in Panel A, the coefficient on the interaction *HAVEN\*POSTCONTRACT* takes on values from -0.253 to -0.601. The effects are economically significant and support the conclusion that TIEAs are successful, at least to

some extent, at curbing round-tripping tax evasion in the tax havens that agree to them. For example, results from Columns (2) and (6) indicate that following the contract date of the TIEA between the haven and the U.S., the inbound equity (debt) FPI from the tax haven decreases by approximately 38% (45%) relative to countries without TIEAs over the same time period.<sup>26</sup>

Panel B of Table III presents the analogous tests using the effective date of the TIEAs in place of the signing date. Here again, the results indicate that entering into an information sharing agreement between the U.S. and a tax haven decreases the equity and debt FPI into the U.S. from the haven, consistent with a decrease in round-tripping through the haven. The coefficient on *HAVEN\*POSTEFFECTIVE* is negative and significant across seven of eight specifications, with values ranging from -0.005 to -0.528.

Table IV presents the results of the estimation of equation (2) where the events of interest are the dates on which the OECD announced their watch lists for tax havens, as discussed above. This is a more general approach and the event date is not country specific to the U.S. Panel A presents the results for equity and debt FPI using *POST1998* as the date of interest and Panel B presents the results for equity FPI and debt FPI using *POST2001*. The results are consistent with Hypothesis 2. In Panel A, the coefficients on the interaction term *HAVEN\*POST1998* are negative and significant across each specification for both equity and debt FPI, taking on values from -0.277 to -0.525, depending on the specification. These findings indicate reduced inbound FPI from tax haven countries after the increase in scrutiny from the OECD. Similar results obtain in Panel B; the coefficients on *HAVEN\*POST2001* are negative and significant across each of the specifications for equity FPI as well as for debt FPI.

In Table V, we include both test variables, U.S. tax rates and the signing dates of the TIEA agreements. The results continue to be consistent with tax evasion having an effect on

inbound FPI. The coefficients on the interaction of *HAVEN* with both capital gains and ordinary tax rates are positive and significant. The coefficient on *HAVEN\*POSTCONTRACT* is negative and significant in seven of eight specifications.

#### *E. Robustness tests*

##### *E.1. Hedge fund and pension investment*

In this section, we discuss tests conducted to mitigate concerns about the effect of FPI from hedge funds and pension funds. For regulatory reasons, the structure of large hedge funds often includes an offshore fund (Stulz (2007)). In addition, pension funds often invest in hedge funds (or private equity funds or real estate funds) that are located offshore for legal tax avoidance reasons (i.e., to avoid the unrelated business income tax in the U.S.; for a detailed discussion, see Cauble (2009)). Thus, if for some reason investments in pensions or hedge funds vary with U.S. tax rates (or with TIEA or OECD events), it is possible that our results are affected by these non-evasion investments. In order to mitigate this concern, we run two separate robustness tests.

First, we include as an additional control the level of hedge fund assets under management in each country, according to the Lipper-Tass database.<sup>27</sup> Unfortunately, the dataset covers only a small fraction of the countries and time periods in our original sample; the sample is reduced to 1,573 observations in this test. To retain as many observations as possible, we estimate a baseline version of equations (1) and (2) that includes controls for GDP, population, and the monthly level of hedge fund assets. After controlling for the level of hedge fund assets in each country, the tenor of the results (in the Internet Appendix) is unchanged. That is, we continue to find that FPI through tax havens is associated with the expected benefits and costs of tax evasion as predicted.

Second, in a different estimation, we include as a control the level of pension investments in the U.S. Specifically, we include the log of the quarterly amount of total financial assets held by private pension funds in a given quarter as reported by the Federal Reserve. In estimating this specification, we omit the time fixed effects (because they are perfectly collinear with quarterly pension investment, which varies by time but not country) and instead include U.S. tax rates, population, GDP, the S&P 500 equity market return, and a basket of foreign exchange rates from the Federal Reserve. Again, we find that the tenor of the main results, as reported in the Internet Appendix, is unchanged. While holding constant the effect of total pension investment, FPI via tax havens is still increasing in U.S. tax rates and decreasing in tax enforcement measures (TIEA and OECD dates), consistent with round-tripping tax evasion by U.S. individuals.

### *E.2. Regional time trends*

It is likely that different regions tend to invest in U.S. debt and equity securities at different rates over time. However, the fixed effect structure of our tests picks up shocks that affect all countries simultaneously. To the extent that any regional time trend is not accounted for by the fixed effects or the control variables, we potentially have an omitted correlated variable problem. To account for this possibility, in tests presented in the Internet Appendix, we introduce as control variables regional fixed effects that are interacted with a time trend variable. The results of this test reveal that the main inferences are unchanged—the regional time trends load significantly, but the main test variables also continue to load in the predicted directions.

### *E.3. Excluding non-haven countries*

Next we provide an analysis estimating the effects within tax havens using the information sharing indicators (*POSTCONTRACT* and *POSTEFFECTIVE*) by excluding non-haven countries from the analysis. This test is intended to mitigate concerns about tax havens



exhibiting different trends than non-tax havens in the information sharing part of the analysis. Note that estimating the regressions using only the tax havens is asking a lot from the data because we only have a small number of tax havens. We estimate the following regression in untabulated tests over the tax havens:

$$\text{Log}(FPI_{i,t}) = \alpha_{\text{country}} + \alpha_{\text{year-month}} + \beta_1 \text{POSTEFFEFFECTIVE}_t + \gamma_K \text{Controls}_{i,t} + \varepsilon_{i,t}. \quad (3)$$

The variable of interest in this analysis is *POSTEFFEFFECTIVE*, because there is no interaction to test without the non-haven control group. The results of this test are reported in the Internet Appendix. We find that the coefficient on *POSTEFFEFFECTIVE* is negative and significant in four out of six specifications. Using the contract date of the information sharing agreement instead of the effective date, the *POSTCONTRACT* variable also is negative and significant in four of six specifications. Thus, the non-haven countries do not appear to be driving the results.

#### *E.4. Randomized treatment group*

To ensure that the effect we are observing is not somehow a mechanical relation in our exercise or data, we replicate our tests with only the non-haven countries. We randomly select 11 countries from the non-haven group (the same number as we have actual havens in the sample, after the exclusion of the Cayman Islands) and we label these 11 randomly selected countries as havens. We then re-estimate an alternate version of equations (1) and (2) except that the *HAVEN* indicator is now set equal to one for 11 random “pseudo haven” locations and that *LOGPOP* and *LOGGDP* are the only independent variables (to maximize the sample). We then repeat the process 100 times and test whether the mean of the coefficients on the interactions with *HAVEN* are significantly different from zero. Absent a mechanical relation in the data, we expect to find the coefficients on the interactions with *HAVEN* to be equal to zero. The results of this robustness test, as presented in the Internet Appendix, are consistent with this prediction. We

find that the pseudo havens do not have FPI that is associated with changes in U.S. tax rates. Nor do the pseudo havens have changes in FPI following the signing of TIEAs for actual havens. We interpret this evidence as consistent with our inference that the patterns we observe are due to tax evasion via tax haven countries.

## **V. Conclusion**

This paper examines one form of offshore tax evasion and its effects on FPI. Specifically, we examine the effects of “round tripping” tax evasion in U.S. equity and debt markets, whereby U.S. individuals route their U.S. investments through entities in tax havens to appear as if they are foreign investors. Under the economic theory of crime as applied to tax evasion (Becker (1968), Allingham and Sandmo (1972), Slemrod (2007)), investors face a tension between the incentives to evade and the likelihood of being caught. We use variation in each to identify the extent to which FPI from tax havens is due to round-tripping tax evasion. We find evidence consistent with both the incentives to evade U.S. taxation (i.e., U.S. tax rates) and expected costs of evasion detection (i.e., increased enforcement efforts by world authorities) affecting the amount of FPI in U.S. debt and equity markets from tax havens. To our knowledge, this is the first empirical evidence of investor-level tax evasion affecting cross-border investment in equity and debt markets. Our paper contributes to the literature on the effects of taxation on financial decisions, particularly cross-border taxation on securities markets, as well as the growing literature on personal finance. Until now, the literature has focused on the effects of taxes as legally applied. We push the literature forward into examining the effects of tax evasion and provide new insights into an important factor in household investment decisions. Our findings have policy implications as well because they demonstrate both the tax revenue generated from information sharing agreements and the unintended tax revenue lost to offshore evasion when

increasing marginal tax rates. Finally, the results have implications for the home-bias literature, suggesting that home-bias is stronger than previously thought, as some of what appears to be foreign investment is actually coming from domestic investors who are evading taxes.

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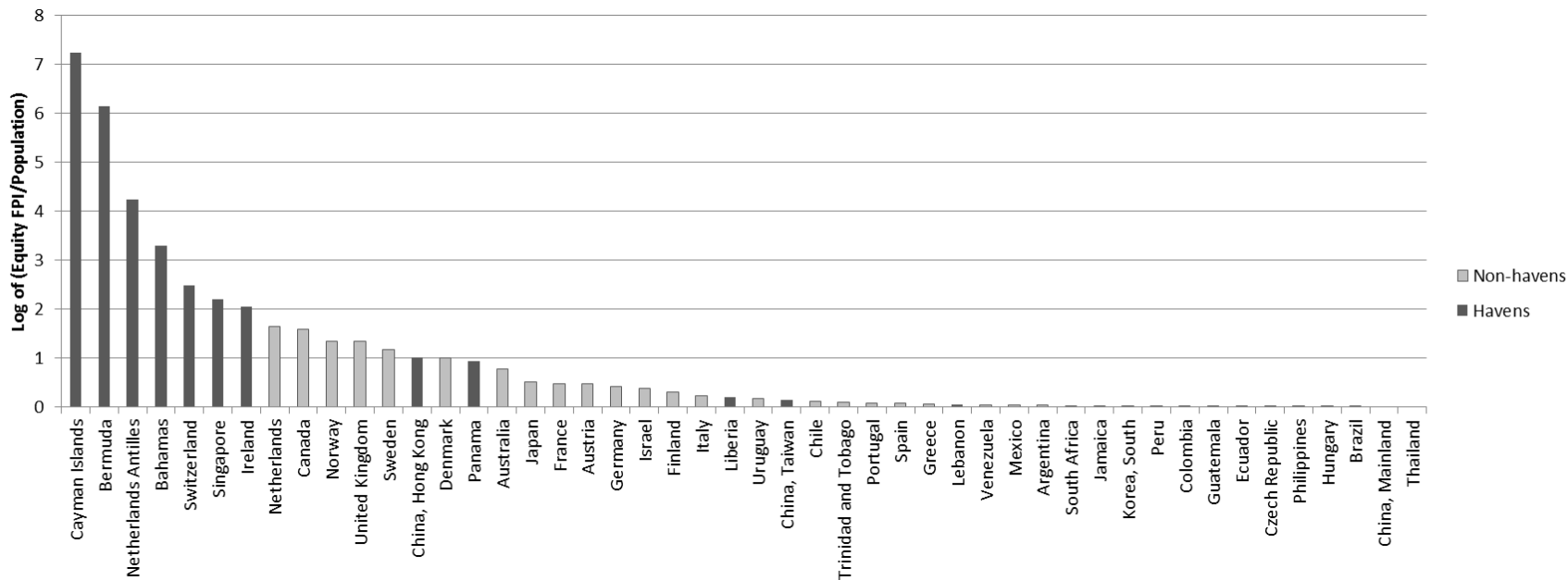
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**Figure 1**  
**Average Equity Foreign Portfolio Investment into the United States, scaled by Population**

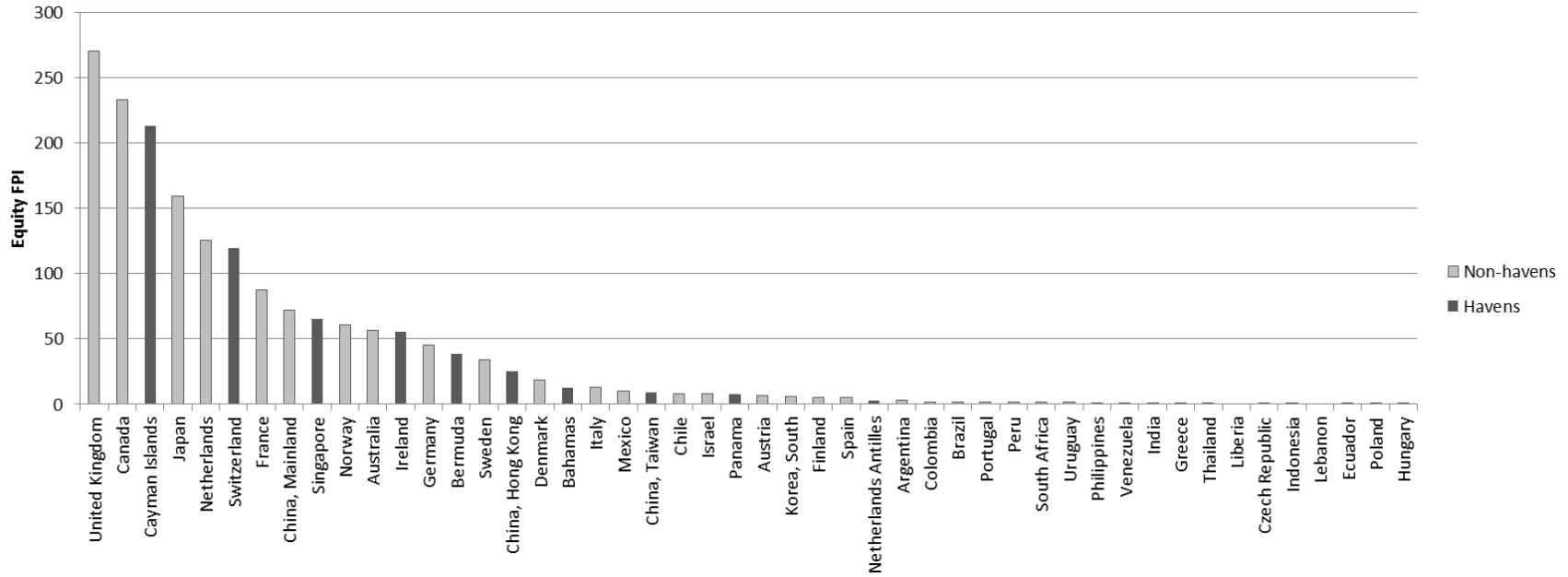
In this figure, we present the average monthly U.S. inbound equity foreign portfolio investment for each country in the sample with non-zero values of FPI. Specifically, we take the log of the average ratio of equity FPI to population for each country. The dark gray bars represent countries identified as tax havens and the light gray bars represent countries that are not considered tax havens. See Table I for the definition of *HAVEN*.



**Figure 2**

**Total Equity Foreign Portfolio Investment in 2008 into the United States - Unscaled**

In this figure, we present the U.S. inbound equity foreign portfolio investment at the end of 2008 for each country in the sample with non-zero values of FPI. Equity FPI is measured in billions of U.S. dollars. The dark gray bars represent countries identified as tax havens and the light gray bars represent countries that are not considered tax havens. See Table I for the definition of *HAVEN*.



**Table I**  
**Descriptive Statistics and Tax Rates**

In this table, we present country-level variables for the 59 countries in the sample (Panel A) as well as tax rates over the sample period, 1984-2008 (Panel B). In Panel A, the first column presents an indicator for whether the country is considered a tax haven, *HAVEN*. This variable is equal to one if the country is identified in the 1999 OECD report or Hines and Rice (1994) as a tax haven and equal to zero otherwise. The next two columns present the average monthly equity and debt U.S. inbound foreign portfolio investment (*FPI*), as reported by the Federal Reserve Board. The final two columns present the average population and GDP of the country. FPI and GDP are presented in millions of U.S. dollars. In Panel B, we present the ordinary income and long-term capital gains tax rates for individuals over time.

Panel A: Country Descriptive Statistics

Country	HAVEN	Mean Equity FPI	Mean Debt FPI	Mean Population	Mean GDP
Argentina	0	1,743	641	35,288,234	203,684
Australia	0	23,493	4,803	18,448,743	417,651
Austria	0	4,867	1,476	7,938,208	214,123
Brazil	0	965	347	165,117,986	645,645
Bulgaria	0	8	3	8,303,086	19,466
Canada	0	120,711	22,260	29,706,545	722,903
Chile	0	1,950	530	14,572,628	70,023
China, Mainland	0	6,249	7,800	1,209,801,353	1,183,393
Colombia	0	611	585	37,408,073	90,516
Czech Republic	0	123	55	10,293,554	79,702
Denmark	0	9,348	2,332	5,272,135	175,418
Ecuador	0	167	122	11,513,778	21,755
Egypt	0	169	198	65,883,036	71,754
Finland	0	1,825	671	5,110,627	137,520
France	0	37,022	12,718	58,323,345	1,500,516
Germany	0	42,230	26,045	80,990,187	2,101,145
Ghana	0	5	1	17,978,919	7,448
Greece	0	729	91	10,634,863	146,676
Guatemala	0	152	77	10,508,519	17,197
Hungary	0	67	92	10,281,951	58,755
India	0	328	66	955,352,745	484,703
Indonesia	0	219	142	196,286,323	192,983
Israel	0	2,960	1,150	5,731,652	94,141
Italy	0	14,212	2,056	57,294,370	1,244,823
Jamaica	0	72	31	2,509,946	7,251
Japan	0	85,521	44,484	125,379,208	3,868,751
Korea, South	0	896	2,002	45,278,415	481,559
Mexico	0	4,988	3,214	92,152,122	489,180
Morocco	0	46	11	26,816,891	38,421

**Table I (continued)**

<b>Country</b>	<b>HAVEN</b>	<b>Mean Equity FPI</b>	<b>Mean Debt FPI</b>	<b>Mean Population</b>	<b>Mean GDP</b>
Netherlands	0	67,870	18,481	15,554,533	414,857
Norway	0	13,144	5,241	4,410,791	179,290
Pakistan	0	85	67	128,165,631	69,528
Peru	0	439	194	24,415,978	51,925
Philippines	0	531	200	72,345,695	72,103
Poland	0	93	74	38,200,844	173,991
Portugal	0	976	496	10,180,917	115,942
Romania	0	12	5	22,427,833	58,208
South Africa	0	1,444	171	40,384,849	151,276
Spain	0	3,787	2,163	40,466,238	682,870
Sweden	0	19,966	3,576	8,779,005	265,312
Syria	0	14	5	15,400,673	19,196
Thailand	0	220	70	60,503,663	128,804
Trinidad And Tobago	0	131	84	1,270,364	8,764
Turkey	0	198	22	62,676,938	254,102
United Kingdom	0	167,698	99,942	58,474,452	1,398,482
Uruguay	0	653	266	3,209,825	16,233
Venezuela	0	1,256	575	22,693,731	97,927
Bahamas	1	7,869	2,684	285,554	4,218
Bermuda	1	29,175	25,715	61,331	2,943
Cayman Islands	1	63,117	72,713	35,325	1,412
China, Hong Kong	1	11,689	4,569	6,268,693	133,165
China, Taiwan	1	3,516	2,659	21,394,942	315,109
Ireland	1	27,895	28,378	3,841,523	120,169
Lebanon	1	234	60	3,502,755	12,835
Liberia	1	568	287	2,583,089	526
Netherlands Antilles	1	12,553	2,084	186,959	2,560
Panama	1	4,507	1,015	2,763,603	10,269
Singapore	1	33,731	6,550	3,653,550	78,407
Switzerland	1	79,279	21,878	7,041,086	275,271

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**Table I (continued)**

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## Panel B: U.S. Tax Rates Over Sample Period

<b>Year/Date</b>	<b>Ordinary Rate</b>	<b>Long-Term Capital Gains Rate</b>
2008	35	15
2007	35	15
2006	35	15
2005	35	15
2004	35	15
5/6/2003-12/31/2003	35	15
1/1/2003-5/5/2003	35	20
2002	38.6	20
2001	39.1	20
2000	39.6	20
1999	39.6	20
1998	39.6	20
5/7/1997-12/31/1997	39.6	20
1/1/97 – 5/6/97	39.6	28
1996	39.6	28
1995	39.6	28
1994	39.6	28
1993	39.6	28
1992	31	28
1991	31	28
1990	33	33
1989	33	33
1988	33	33
1987	38.5	28
1986	50	20
1985	50	20
1984	50	20

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**Table II**  
**Tests of the Effect of U.S. Tax Rates on FPI from Havens Relative to Non-Havens**

In this table, we present the results of Prais-Winsten panel regressions of U.S. inbound FPI (*EQUITY* or *DEBT*) on the interaction of *HAVEN* and the U.S. long-term capital gains rate (*LTCGRATE*) and ordinary tax rate (*ORDRATE*). The specifications include control variables for the country's annual logged GDP (*LOGGDP*), annual logged population (*LOGPOP*), annual domestic tax rate (*LOCAL TAX RATE*), annual logged landline phone coverage (*LOG PHONE*) and annual foreign exchange rate (*EXCHRATE*), as well as country and year-month fixed effects. Panel-corrected standard errors are reported in parentheses. \* indicates statistical significance at 10%; \*\* indicates statistical significance at 5%, and \*\*\* indicates statistical significance at 1%; one-tailed where we have predictions, two-tailed otherwise.

Tests of Benefits of Tax Evasion – U.S. tax rates and investment from havens									
	Predicted Sign	(1) <i>EQUITY</i>	(2) <i>EQUITY</i>	(3) <i>EQUITY</i>	(4) <i>EQUITY</i>	(5) <i>DEBT</i>	(6) <i>DEBT</i>	(7) <i>DEBT</i>	(8) <i>DEBT</i>
<i>HAVEN*LTCGRATE</i>	+	0.015*** (0.002)	0.015*** (0.002)	0.016*** (0.002)	0.024*** (0.002)	0.042*** (0.005)	0.043*** (0.005)	0.037*** (0.004)	0.038*** (0.004)
<i>HAVEN*ORDRATE</i>	+	0.028*** (0.003)	0.028*** (0.003)	0.026*** (0.003)	0.036*** (0.003)	0.023*** (0.007)	0.024*** (0.007)	0.030*** (0.005)	0.039*** (0.006)
<i>LOGGDP</i>		-1.766*** (0.119)	-1.767*** (0.117)	-1.353*** (0.153)	-0.413*** (0.151)	-0.741** (0.288)	-0.752*** (0.287)	-0.693** (0.294)	1.416*** (0.246)
<i>LOGPOP</i>		0.078** (0.031)	0.077** (0.034)	0.227*** (0.046)	-0.391*** (0.042)	-0.060 (0.093)	-0.043 (0.094)	0.548*** (0.076)	0.301*** (0.075)
<i>LOCAL TAX RATE</i>		0.007*** (0.001)	0.007*** (0.001)			0.023*** (0.002)	0.025*** (0.003)		
<i>HAVEN*LOCAL TAX RATE</i>			0.000 (0.002)				-0.004 (0.004)		
<i>LOG PHONE</i>				-0.024 (0.029)				0.123* (0.069)	
<i>EXCHRATE</i>					-0.082*** (0.008)				-0.042*** (0.012)
Country Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		11,271	11,271	15,606	10,115	11,271	11,271	15,606	10,115
Adjusted R-squared		0.978	0.978	0.970	0.982	0.853	0.853	0.856	0.908

**Table III**

**Tests of the Effect of Tax Information Exchange Agreements on FPI from Havens Relative to Non-Havens**

In this table, we present the results of Prais-Winsten panel regressions of U.S. inbound equity and debt FPI on the interaction of *HAVEN* and date indicator variables for when (if ever) the country entered into a tax information exchange agreement (TIEA) with the United States. The variables are set equal to one after the information sharing agreement was signed (*POSTCONTRACT*) and after it went to force (*POSTEFFECTIVE*). Panel A (Panel B) reports tests of the effect of the TEIA signing (effective) date on U.S. inbound FPI. The specifications include control variables for the country's annual logged GDP (*LOGGDP*), annual logged population (*LOGPOP*), annual domestic tax rate (*LOCAL TAX RATE*), annual logged landline phone coverage (*LOG PHONE*) and annual foreign exchange rate (*EXCHRATE*), as well as country and year-month fixed effects. Panel-corrected standard errors are reported in parentheses. \* indicates statistical significance at 10%; \*\* indicates statistical significance at 5%, and \*\*\* indicates statistical significance at 1%; one-tailed where we have predictions, two-tailed otherwise.

Panel A: Tests of Costs of Tax Evasion – TIEA signing date and investment from havens

	Predicted Sign	(1) <i>EQUITY</i>	(2) <i>EQUITY</i>	(3) <i>EQUITY</i>	(4) <i>EQUITY</i>	(5) <i>DEBT</i>	(6) <i>DEBT</i>	(7) <i>DEBT</i>	(8) <i>DEBT</i>
<i>HAVEN*POSTCONTRACT</i>	–	-0.483*** (0.036)	-0.475*** (0.035)	-0.338*** (0.030)	-0.537*** (0.037)	-0.601*** (0.060)	-0.591*** (0.061)	-0.253*** (0.056)	-0.433*** (0.055)
<i>LOGGDP</i>		-1.991*** (0.117)	-1.993*** (0.118)	-1.511*** (0.150)	-0.543*** (0.150)	-1.175*** (0.290)	-1.165*** (0.290)	-0.951*** (0.294)	1.220*** (0.246)
<i>LOGPOP</i>		0.061** (0.030)	0.044 (0.032)	0.198*** (0.044)	-0.454*** (0.042)	-0.090 (0.094)	-0.110 (0.094)	0.529*** (0.075)	0.233*** (0.076)
<i>LOCAL TAX RATE</i>		0.007*** (0.001)	0.005*** (0.001)			0.026*** (0.002)	0.024*** (0.003)		
<i>HAVEN*LOCAL TAX RATE</i>			0.004*** (0.001)				0.004 (0.004)		
<i>LOG PHONE</i>				0.001 (0.029)				0.176*** (0.067)	
<i>EXCH RATE</i>					-0.084*** (0.008)				-0.035*** (0.012)
Country Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		11,271	11,271	15,606	10,115	11,271	11,271	15,606	10,115
Adjusted R-squared		0.978	0.978	0.970	0.983	0.851	0.851	0.855	0.908

**Table III (continued)**  
**Tests of the Effect of Tax Information Exchange Agreements on FPI from Havens Relative to Non-Havens**

Panel B: Tests of Costs of Tax Evasion – TIEA effective date and investment from havens

	Predicted Sign	(1) <i>EQUITY</i>	(2) <i>EQUITY</i>	(3) <i>EQUITY</i>	(4) <i>EQUITY</i>	(5) <i>DEBT</i>	(6) <i>DEBT</i>	(7) <i>DEBT</i>	(8) <i>DEBT</i>
<i>HAVEN*POSTEFFECTIVE</i>	–	-0.521*** (0.036)	-0.528*** (0.036)	-0.331*** (0.029)	-0.506*** (0.035)	-0.442*** (0.066)	-0.443*** (0.066)	-0.005 (0.058)	-0.181*** (0.058)
<i>LOGGDP</i>		-1.886*** (0.116)	-1.890*** (0.116)	-1.482*** (0.150)	-0.450*** (0.148)	-1.058*** (0.290)	-1.046*** (0.290)	-0.935*** (0.293)	1.285*** (0.243)
<i>LOGPOP</i>		0.057* (0.030)	0.032 (0.032)	0.203*** (0.044)	-0.444*** (0.043)	-0.082 (0.094)	-0.110 (0.094)	0.540*** (0.075)	0.262*** (0.076)
<i>LOCAL TAX RATE</i>		0.009*** (0.001)	0.005*** (0.001)			0.026*** (0.002)	0.023*** (0.003)		
<i>HAVEN*LOCAL TAX RATE</i>			0.006*** (0.001)				0.005 (0.004)		
<i>LOG PHONE</i>				0.002 (0.029)				0.182*** (0.067)	
<i>EXCH RATE</i>						-0.084*** (0.008)			-0.032*** (0.012)
Country Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		11,271	11,271	15,606	10,115	11,271	11,271	15,606	10,115
Adjusted R-squared		0.978	0.978	0.970	0.982	0.851	0.851	0.855	0.908



**Table IV**

**Tests of the Effect of OECD Events on FPI from Havens Relative to Non-Havens**

In this table, we present the results of Prais-Winsten panel regressions of U.S. inbound equity and debt FPI on the interaction of *HAVEN* and two date indicator variables, *POST1998* and *POST2001*. *POST1998* and *POST2001* are set equal to one for all observations dated after 1998 and 2001, respectively, the years after the OECD increased pressure on tax havens. Panel A (Panel B) reports tests of the effect of OECD pressure in 1998 (2001). The specifications include control variables for the country's annual logged GDP (*LOGGDP*), annual logged population (*LOGPOP*), annual domestic tax rate (*LOCAL TAX RATE*), annual logged landline phone coverage (*LOG PHONE*) and annual foreign exchange rate (*EXCHRATE*), as well as country and year-month fixed effects. Panel-corrected standard errors are reported in parentheses. \* indicates statistical significance at 10%; \*\* indicates statistical significance at 5%, and \*\*\* indicates statistical significance at 1%; one-tailed where we have predictions, two-tailed otherwise.

**Panel A: Tests of Costs of Tax Evasion – 1998 OECD initiative date and investment from havens**

	Predicted Sign	(1) <i>EQUITY</i>	(2) <i>EQUITY</i>	(3) <i>EQUITY</i>	(4) <i>EQUITY</i>	(5) <i>DEBT</i>	(6) <i>DEBT</i>	(7) <i>DEBT</i>	(8) <i>DEBT</i>
<i>HAVEN*POST1998</i>	–	-0.331*** (0.029)	-0.340*** (0.031)	-0.296*** (0.026)	-0.432*** (0.030)	-0.413*** (0.072)	-0.438*** (0.076)	-0.277*** (0.059)	-0.525*** (0.060)
<i>LOGGDP</i>		-1.759*** (0.118)	-1.756*** (0.116)	-1.333*** (0.153)	-0.429*** (0.151)	-0.851*** (0.290)	-0.854*** (0.289)	-0.821*** (0.295)	1.403*** (0.246)
<i>LOGPOP</i>		0.114*** (0.030)	0.120*** (0.034)	0.242*** (0.045)	-0.331*** (0.042)	-0.046 (0.094)	-0.030 (0.095)	0.555*** (0.077)	0.354*** (0.075)
<i>LOCAL TAX RATE</i>		0.006*** (0.001)	0.007*** (0.001)			0.023*** (0.002)	0.025*** (0.003)		
<i>HAVEN*LOCAL TAX RATE</i>			-0.001 (0.002)				-0.003 (0.004)		
<i>LOG PHONE</i>				-0.033 (0.029)				0.149** (0.069)	
<i>EXCH RATE</i>						-0.085*** (0.008)			-0.042*** (0.013)
Country Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		11,271	11,271	15,606	10,115	11,271	11,271	15,606	10,115
Adjusted R-squared		0.978	0.978	0.970	0.983	0.852	0.852	0.856	0.908

**Table IV (continued)**  
**Tests of the Effect of OECD Events on FPI from Havens Relative to Non-Havens**

Panel B: Tests of Costs of Tax Evasion – 2001 OECD initiative date and investment from havens

	Predicted Sign	(1) EQUITY	(2) EQUITY	(3) EQUITY	(4) EQUITY	(5) DEBT	(6) DEBT	(7) DEBT	(8) DEBT
<i>HAVEN*POST2001</i>	–	-0.329*** (0.031)	-0.319*** (0.031)	-0.271*** (0.030)	-0.448*** (0.032)	-0.389*** (0.076)	-0.382*** (0.078)	-0.615*** (0.057)	-0.850*** (0.053)
<i>LOGGDP</i>		-1.773*** (0.118)	-1.776*** (0.117)	-1.384*** (0.152)	-0.435*** (0.152)	-0.837*** (0.287)	-0.845*** (0.287)	-0.691** (0.294)	1.424*** (0.248)
<i>LOGPOP</i>		0.098*** (0.030)	0.092*** (0.033)	0.223*** (0.045)	-0.379*** (0.042)	-0.050 (0.094)	-0.052 (0.095)	0.546*** (0.076)	0.322*** (0.074)
<i>LOCAL TAX RATE</i>		0.007*** (0.001)	0.006*** (0.001)			0.024*** (0.002)	0.024*** (0.003)		
<i>HAVEN*LOCAL TAX RATE</i>			0.001 (0.002)				0.000 (0.004)		
<i>LOG PHONE</i>				-0.018 (0.029)				0.121* (0.068)	
<i>EXCH RATE</i>						-0.086*** (0.008)			-0.049*** (0.013)
Country Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		11,271	11,271	15,606	10,115	11,271	11,271	15,606	10,115
Adjusted R-squared		0.978	0.978	0.970	0.982	0.851	0.851	0.855	0.908

**Table V**

**Test of the Effect of U.S. Tax Rates and Tax Information Exchange Agreements on FPI from Havens Relative to Non-Havens**

In this table, we present the results of Prais-Winsten panel regressions of U.S. inbound FPI (*EQUITY* or *DEBT*) on the interaction of *HAVEN* and the U.S. long-term capital gains rate (*LTCGRATE*) and ordinary tax rate (*ORDRATE*) and the interaction of *HAVEN* and the contract date of TIEA (*POSTCONTRACT*), as defined in Tables III. The specifications include control variables for the country's annual logged GDP (*LOGGDP*), annual logged population (*LOGPOP*), annual domestic tax rate (*LOCAL TAX RATE*), annual logged landline phone coverage (*LOG PHONE*) and annual foreign exchange rate (*EXCHRATE*), as well as country and year-month fixed effects. Panel-corrected standard errors are reported in parentheses. \* indicates statistical significance at 10%; \*\* indicates statistical significance at 5%, and \*\*\* indicates statistical significance at 1%; one-tailed where we have predictions, two-tailed otherwise.

	Predicted Sign	(1) <i>EQUITY</i>	(2) <i>EQUITY</i>	(3) <i>EQUITY</i>	(4) <i>EQUITY</i>	(5) <i>DEBT</i>	(6) <i>DEBT</i>	(7) <i>DEBT</i>	(8) <i>DEBT</i>
<i>HAVEN*POSTCONTRACT</i>	-	-0.393*** (0.033)	-0.394*** (0.033)	-0.231*** (0.030)	-0.394*** (0.035)	-0.393*** (0.072)	-0.388*** (0.071)	-0.011 (0.061)	-0.181*** (0.058)
<i>HAVEN*LTCGRATE</i>	+	0.009*** (0.002)	0.008*** (0.002)	0.011*** (0.002)	0.015*** (0.002)	0.036*** (0.005)	0.037*** (0.005)	0.037*** (0.004)	0.035*** (0.004)
<i>HAVEN*ORDRATE</i>	+	0.022*** (0.003)	0.022*** (0.003)	0.021*** (0.002)	0.028*** (0.003)	0.018*** (0.007)	0.019*** (0.007)	0.030*** (0.005)	0.035*** (0.006)
<i>LOGGDP</i>		-1.869*** (0.118)	-1.873*** (0.116)	-1.398*** (0.153)	-0.482*** (0.150)	-0.878*** (0.290)	-0.886*** (0.289)	-0.690** (0.296)	1.389*** (0.248)
<i>LOGPOP</i>		0.052* (0.031)	0.049 (0.033)	0.213*** (0.045)	-0.433*** (0.042)	-0.083 (0.093)	-0.068 (0.094)	0.547*** (0.076)	0.281*** (0.075)
<i>LOCAL TAX RATE</i>		0.007*** (0.001)	0.007*** (0.001)			0.024*** (0.002)	0.026*** (0.003)		
<i>HAVEN*LOCAL TAX RATE</i>			0.001 (0.002)				-0.003 (0.004)		
<i>LOG PHONE</i>				-0.023 (0.029)				0.122* (0.069)	
<i>EXCHRATE</i>					-0.084*** (0.008)				-0.043*** (0.012)
Country Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		11,271	11,271	15,606	10,115	11,271	11,271	15,606	10,115
Adjusted R-squared		0.978	0.978	0.970	0.983	0.852	0.852	0.856	0.908

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<sup>1</sup> We discuss how this works in more detail in Section I.

<sup>2</sup> <http://levin.senate.gov/newsroom/supporting/2008/071708PSIRReport.pdf>. Further, the opportunity for tax evasion is likely increasing over time. In recent decades, the globalization of the financial system and improvements in communication and technology (e.g., the internet), have made tax havens increasingly easy to access and just a mouse click away. For example, an online search for the phrase “open offshore investment account” will yield dozens pages of advertisements for such services. In addition, Guttentag and Avi-Yonah (2005) describe the ease with which one can open a Cayman account and support their claim by stating “as evident from any perusal of the back pages of The Economist magazine, where law firms advertising such services abound.” We note that having a foreign account is not in itself illegal; however, failing to report the income is illegal.

<sup>3</sup> By 2010, inbound FPI totaled \$10.7 trillion, an amount equivalent to approximately 5% of the worldwide total of equity and debt (McKinsey & Company (2011), also see the 2010 treasury report found at <http://www.treasury.gov/resource-center/data-chart-center/tic/Documents/shla2010r.pdf>).

<sup>4</sup> The U.S. does not generally tax foreign investors on capital gains from U.S. securities, nor does it tax portfolio interest income. It taxes dividends at special withholding tax rates, which tend to be quite stable over time and independent of ordinary tax rates.

<sup>5</sup> Investing via a high-tax jurisdiction would subject the investor to higher foreign taxes (relative to a tax haven) and defeat the purpose of tax evasion.

<sup>6</sup> Although these economic magnitudes are the first documented in the literature, in our minds they are best viewed as providing a range of estimates. These estimates are subject to our empirical assumptions and limited to the tax havens we examine in this study.

<sup>7</sup> These are rough estimates assuming the income would have been taxable at rates prevailing in the 2003-2008 period, with one-half taxable at ordinary rates and one-half taxable at long-term capital gains rates and an expected return of 8%.

<sup>8</sup> Hines (2005) examines whether tax havens prosper and finds that GDP growth in haven nations is faster than the growth in other countries and that haven governments are well funded. For other studies and articles on tax havens see Desai, Foley, and Hines (2006a, b), Dharmapala and Hines (2009), Sullivan (2004), and U.S. Senate Committee on Finance (2002).

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<sup>9</sup> In our tests we cannot know whether the initial investment is made with taxed or untaxed dollars. We only test for tax evasion on the income earned on the investment.

<sup>10</sup> Senate Permanent Subcommittee on Investigations, July 17, 2008.

<sup>11</sup> As evidence of the rigor of the fixed effects specification, the country fixed effects explain more than 80% of the variation in both independent and dependent variables. To the extent that alternative control variables cannot capture country effects, omitting the country fixed effect would induce a correlated omitted variable problem.

<sup>12</sup> We include both rates for completeness and because we expect both rates to be important. We do not have predictions on which rate will be more important. For example, when the tax evader initially hides the money in the tax haven he will not have yet made any investments and likely considers an overall expected rate in his decision to evade.

<sup>13</sup> We do not test the effect of the U.S. dividend tax rate in our main tests for several reasons. First, the U.S. dividend withholding rate that applies to dividend income discourages tax avoidance of dividend income (Desai and Dharmapala (2011)). Second, the dividend tax rate and the ordinary income tax rate were the same rate until 2003, at which time dividend tax rates were reduced and not linked to the ordinary rate. We do not expect tests of the dividend rate to be useful in our analysis because 1) the withholding rate is often greater than the dividend rate, which would deter, rather than promote, evasion and 2) the high correlation between ordinary income and dividend tax rates (1 in many years) presents an econometric issue.

<sup>14</sup> <http://data.un.org/Default.aspx>

<sup>15</sup> [http://www.theodora.com/wfb/abc\\_world\\_fact\\_book.html](http://www.theodora.com/wfb/abc_world_fact_book.html). When control variables are unavailable for some years, we use the average of the available observations before and after the observation.

<sup>16</sup> For haven countries, if the *LOCAL TAX RATE* is not available from these sources, we set it equal to zero. For all other countries, if it is missing, the variable is set to missing.

<sup>17</sup> We do not have complete coverage of *LOCAL TAX RATE*, *LOGPHONE* and *EXCHRATE*. In order to maximize sample size, we estimate the regressions with each of these variables included separately. If we were to include them all simultaneously, the sample size would decrease by about 80%.

<sup>18</sup> In our sample, four havens in our sample signed TIEAs with the U.S.: Bermuda, Bahamas, Netherlands Antilles, and Switzerland (Switzerland's is part of a larger tax treaty). The agreements were signed in various years, ranging

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from 1988 - 2007. Note the Cayman Islands also signed a TIEA but we exclude them from our regression analysis because of concerns that the results might capture legal tax avoidance in addition to tax evasion.

<sup>19</sup> The treasury reports that there are “two types of respondents to the surveys: U.S. resident issues of securities and U.S. resident custodians (including securities depositories) that manage the safekeeping of U.S securities for foreign resident entities.” <http://www.treasury.gov/resource-center/data-chart-center/tic/Documents/shl2009r.pdf>

<sup>20</sup> <http://www.ustreas.gov/tic/ticsecd.shtml>

<sup>21</sup> <http://www.treasury.gov/resource-center/data-chart-center/tic/Documents/frbul2006.pdf>

<sup>22</sup> The data can be accessed at the following website:

<http://www.federalreserve.gov/pubs/ifdp/2007/910/default.htm>. The estimated monthly FPI levels are subject to several adjustments to reduce the noise and biases in the data. We refer the reader to Bertaut and Tryon (2007) for extensive details.

<sup>23</sup> Curcuru et al. (2011, p.4) state that the Bertraut and Tryon (2007, FRB) dataset “is the best currently available.”

<sup>24</sup> [http://www.thecityuk.com/media/2358/Hedge\\_Funds\\_2010.pdf](http://www.thecityuk.com/media/2358/Hedge_Funds_2010.pdf)

<sup>25</sup> In all regressions, we correct for serial correlation in FPI using the Prais-Winsten (1954) method for panel data. The approach, which follows Bekaert, Harvey, Lundblad and Siegel (2011; footnote 13), uses a Prais-Winsten regression to account for panel-specific, first-order serial correlation, and panel-corrected standard errors to account for heteroskedasticity and contemporaneous residual correlation across panels (Beck and Katz (1995); Blackwell (2005); Wooldridge (2002)). Clustering in this fixed effects model is not the appropriate solution because the model does not have sufficient “effective” degrees of freedom (i.e., the number of clusters will be less than the number of coefficients). We thank Jeffrey Wooldridge for helpful advice in choosing the appropriate correction for residual correlation in our setting.

<sup>26</sup> Recall that the regression is in semi-log form, so the estimated effect on equity FPI of a TIEA after the effective date is given by  $e^{-0.475} - 1 = -38\%$ .

<sup>27</sup> We thank Jeremiah Green for sharing this dataset with us.