

# Offshore Deposits and Tax Policy

H195B: Senior Honors Thesis

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## **Abstract**

A matter of great debate in recent times is pertaining to the use of tax havens by wealthy individuals for the purpose of tax evasion whether or not reducing the top marginal income tax rates would be an effective means to combating tax evasion. In this paper, I argue that in fact, tax rates are not a significant determinants of deposits in tax haven countries, and thus reducing the top marginal income tax rate would have very little, if any, effect on the deposits in tax havens.

# Introduction<sup>1</sup>

The use of tax havens by wealthy individuals for various financial activities is a matter of great interest to policy makers. In particular, the use of tax havens to evade taxes is a matter of great concern. While tax evasion and offshore financial centers have been studied in great depth in the past, the use of tax havens by individuals is still a topic that needs to be explored in more depth, and in this study, we hope to understand the determinants of personal income tax evasion through the use of tax haven countries better. In particular, we are interested in the deposits held in offshore accounts by individuals and households and the bearing that tax policies have on these deposits. Although the relationship between tax rates and tax evasion has been studied before, the relationship between the two is not clear and unambiguous. While some authors have found that there is a positive association between the two (for example, Clotfelter 1983), others still have found a negative association between the two (for instance, Feinstein 1991). Thus in this study, we attempt to add to this literature on tax evasion by focusing specifically on the impact of tax rates on the level of non-bank deposits held in tax havens. We also attempt to study the differences between developed countries and developing countries in their responses to higher tax rates.

We find that the top marginal income tax rate has an extremely small, positive but insignificant impact on the flow of deposits offshore, the average tax rate has a negative and insignificant effect on deposits for developing countries, while for advanced economies, it is positive, but insignificant. We find that the income tax rate of the previous year has a positive, but small impact, on the deposits in offshore centers. Thus on the whole, there is some evidence for the positive effect of income tax rates on deposits in offshore centers, but it is extremely small and insignificant and thus, it can't be said that there is merit to the idea that reducing income tax rates will lead to a reduction in tax evasion by the use of offshore accounts. In the following sections, we attempt to provide some conceptual background on the workings of tax havens and offshore finance, and then we proceed to explaining our data sources and our results.

## Conceptual Framework

### A. Introduction to Offshore Finance

Offshore finance can be defined very simply as the provision of financial services to non-residents. These services include banking services, lending to corporations and other institutions, or taking deposits from individuals and investing the proceeds in financial markets elsewhere. Defining an “offshore financial center”

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is harder, because there is a need to distinguish between financial centers that cater to both international clients as well as domestic residents (for instance, New York, Tokyo and London), and financial centers that cater majorly only to non-residents (the Cayman Islands and Hong Kong, for instance). In a broad sense, offshore financial centers are usually regions where a large number of financial institutions are engaged in business primarily with non-residents.

The IMF defines offshore centers more specifically, as “Jurisdictions that have relatively large numbers of financial institutions engaged primarily in business with non-residents; or financial systems with external assets and liabilities out of proportion to domestic financial intermediation designed to finance domestic economies; and centers which provide some or all of the following services: low or zero taxation; moderate or light financial regulation; banking secrecy and anonymity” (IMF 2000).

In order to understand the extent to which tax haven countries engage in cross-border finance, let us look at the ratio of cross-border deposits as a share of total deposits received by countries like the Cayman Islands, Luxembourg, Singapore and Hong Kong in comparison to countries like the UK, Japan, France and Germany in the last quarter of 2015. We can see immediately a stark difference between the offshore financial centers and non-offshore financial centers in terms of their level of engagement in cross-border finance.

Offshore centers in addition to banking activities, also provide services such as fund management, insurance, trust business and tax planning. For instance, Bermuda is a leading location for captive insurance, whereby onshore firms establish affiliates in Bermuda that offer insurance for group-wide activities (Lane and Ferretti, 2010, p. 5). Most hedge funds are incorporated in the Cayman Islands (Lane and Ferretti, 2010, p. 5), while Luxembourg is the second largest mutual fund center in the world after the US (Zucman, 2013, p. 5). Additionally, many offshore centers provide headquarter services where firms can incorporate in an offshore financial center in order to benefit from legal and tax advantages. Lane and Ferretti (2010) argue that this could explain portfolio equity holdings in “common stock”, worth \$158 billion, that were held by US residents in the Cayman Islands. Zucman (2013) estimates that about 40% of the world’s foreign direct investments are routed through tax havens such as the British Virgin Islands. Another service provided by many offshore financial centers, in particular by the ones with strict bank secrecy rules like Switzerland, the Cayman Islands and Singapore, is private banking. The banks in these countries do not generally report information about the income earned by their clients, and this makes offshore financial centers attractive to the individuals looking to evade personal income taxes.

For instance, a wealthy US citizen can deposit money in a bank in a tax haven country, say in the Cayman Islands, and this bank can then invest this money in global bonds, equities and mutual funds and generate interest and dividends. This income can be taxed only if the individual self-reports it or if the Cayman Islands banks inform the US, which they are not under obligation to do. Depositing money in an

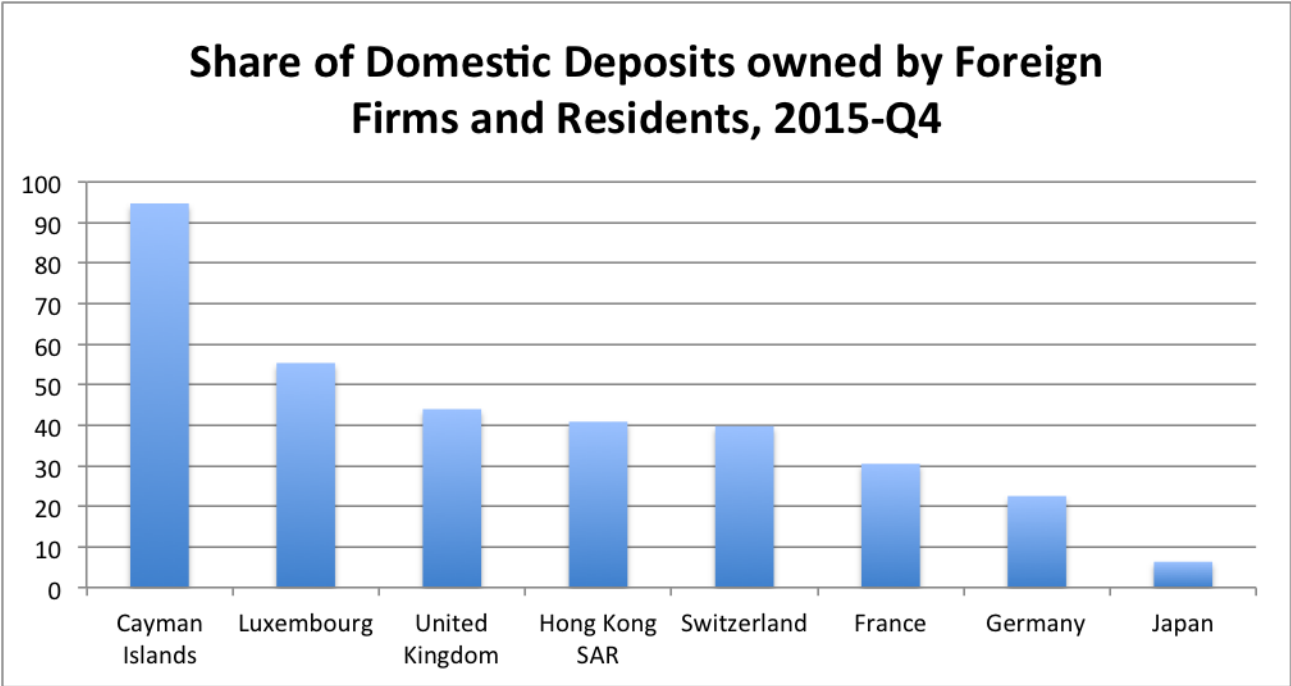


Figure 1

**Source:** BIS Locational Statistics

**Notes:** Ratio of Total Cross-Border Deposits to All Deposits (which includes cross-border, local and unallocated deposits), last quarter of 2015.

international bank is extremely easy, quick and cost efficient, especially in the globalized world that we live in today, and hence international deposits in tax havens are one method by which to evade and/or avoid taxes.

Data on the activities that take place in offshore financial centers are quite sparse, and mostly available only for the activities pertaining to banking. A few offshore centers report to the Bank for International Settlements (BIS) about their balance sheet positions. In particular, in this paper, we are interested in examining the non-bank liabilities reported by the banks in tax haven countries to the BIS, and then, using this data, the question we ask is—Are high tax rates responsible for the flow of funds to offshore centers?

## **B. Patterns in International Deposits held by Tax Haven Countries**

Let us begin by looking at the trend in the flow of deposits from the US to the rest of the world (Figure 2). It can be seen from this figure that over the last 35 years or so, there has been a general upward trend in the outflow of deposits. Then in the years following the global financial crisis, the deposits from the US to the rest of the world started to decline. At their peak, international deposits held by U.S citizens in other countries were about 13% of domestic wealth. That is to say, if we think of GDP as a proxy for the wealth of the country, then about 13% of domestic wealth was held abroad by U.S. citizens in 2010. The question that next comes to mind is, what fraction of this wealth was held in tax haven countries?

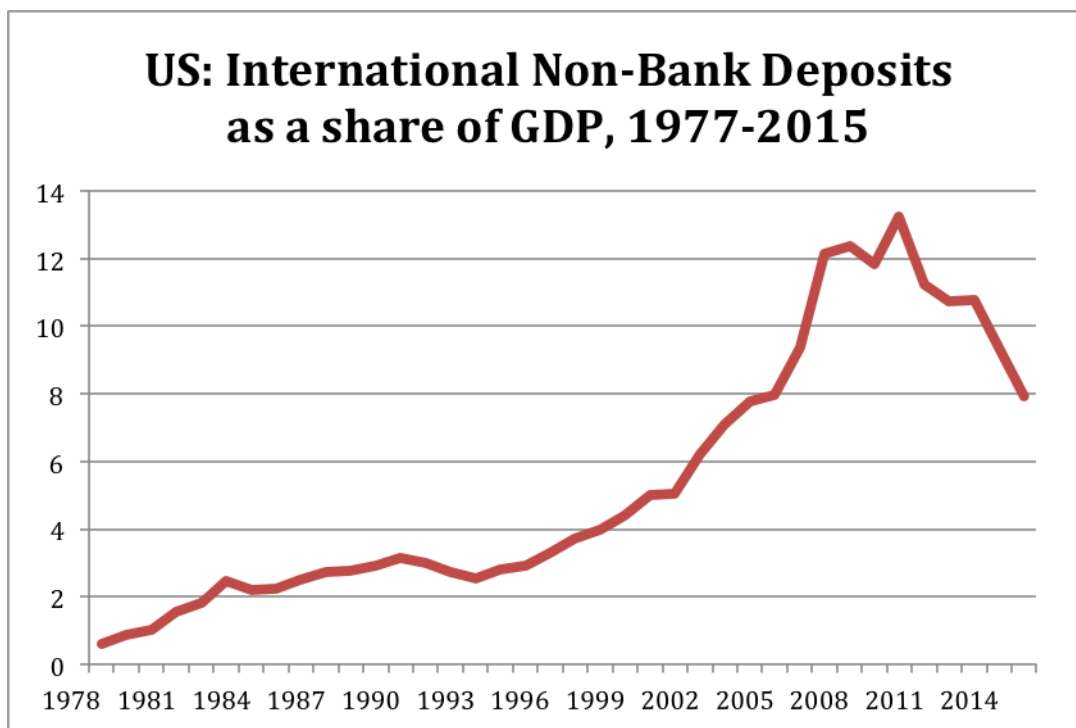


Figure 2

**Source** BIS Locational Statistics and World Bank GDP Statistics

**Notes** The graph shows the ratio of total non-bank international deposits that belong to US citizens to the GDP of the US, measured in constant 2010 US Dollars

Let us think about this question by looking at the evolution of deposits held in tax haven countries over the past 10 years. Figure 3 depicts the total deposits held in tax havens countries as a share of world GDP, from 2003-2013. We see that in the early part of the 2000s, deposits in tax havens rose steadily to about 8.5%, and then started to decline very slowly, after the financial crisis.

To put some numbers to it, in 2008, the US had a total of \$ 3,442,664 million in international deposits. And about \$268,591 million of these liabilities (about 8%) were in offshore centers (not including the Cayman Islands), which is a sizable amount. In particular, about 3.3% of all non-bank liabilities originating from the US were in BIS reporting tax havens.<sup>2</sup>

It is also interesting to compare these trends for an economy like the U.S to economies of developing countries. Figure 4 shows the deposits in Switzerland and Luxembourg that belong to residents of Brazil, India and South Africa. The trajectories for the three countries seem to differ quite a bit, although they all show a decline in the share of deposits in these two tax havens in recent years. The decline gets steeper after

<sup>2</sup>Calculated Using BIS Locational Statistics. The sum of the outstanding liabilities reported by all BIS-reporting tax havens in the last quarter of 2008 comes out to be \$268, 591 million, while the sum of all outstanding non-bank liabilities reported by all tax havens comes out to be to 3.3% of all international liabilities.

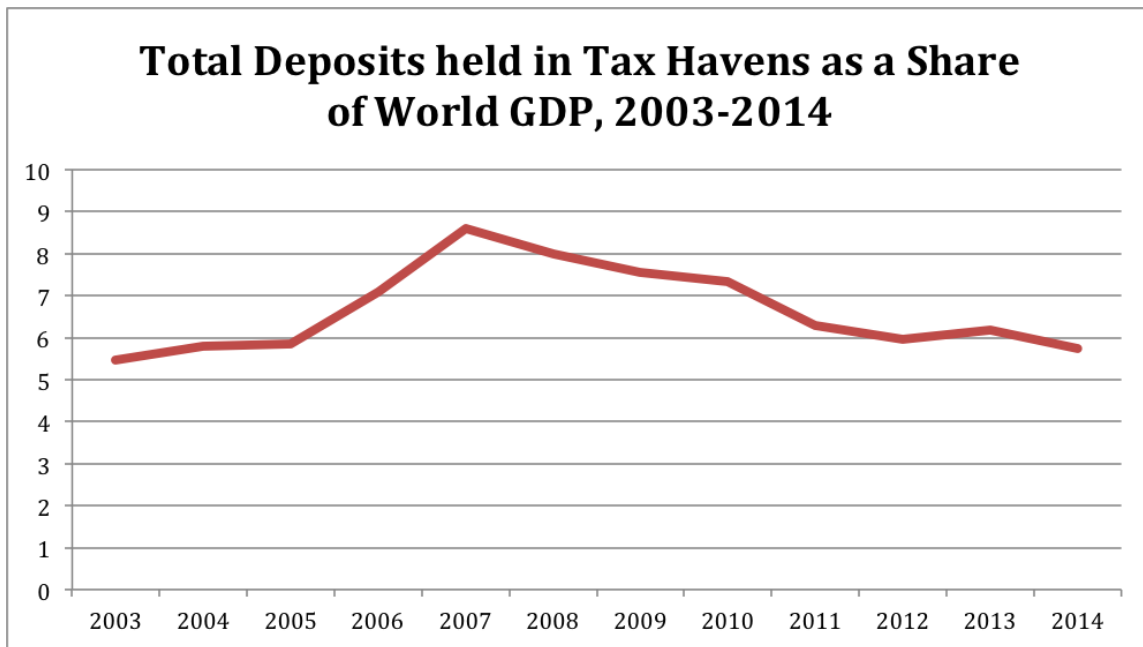


Figure 3

**Source** BIS Locational Statistics and World Bank GDP Statistics

**Notes** Calculated as the ratio of all non-bank deposits reported by BIS reporting tax havens to world GDP in Constant 2010 US Dollars Sample of BIS Reporting Tax Havens used in the calculation: Bahamas, Bermuda, Bahrain, Switzerland, Guernsey, Hong Kong SAR, Ireland, Isle of Man, Jersey, Cayman Islands, Luxembourg, Macao SAR, Panama and Singapore

the financial crisis, which is similar to what we had observed for the United States.

### **C. Top Marginal Income**

The other piece of the puzzle that we are interested in is the income tax rate in the country of residence (or the customer country). Countries typically tax different types of income at different rates. The top marginal income tax rate can be defined as the income tax that individuals that fall into the highest bracket of income would have to pay for every additional dollar of income. The top marginal income tax rate is particularly relevant for the purpose of this paper, since we are interested in the deposits that belong to individuals and households.

Figure 5 displays the top marginal income tax rate in the US, from 1980-2015. It can be seen from the graph that there was a downward trend in the marginal tax rate in the 1980s, followed by a slight increase in the 1990s. It went down again in the early 2000s, and then started to rise after the financial crisis. It is interesting to note that these changes in the interest rates correspond to the changes in trends that we had previously noted for deposits to OFCs.

Figure 6 next plots the top marginal income tax rates in three emerging economies, Brazil, India and South Africa, from 1980-2015 (Figure 5). It can be seen that the 1980s saw these countries have high tax rates, but they have declined since, and in the last few years they have been stable in the 28-40% range.



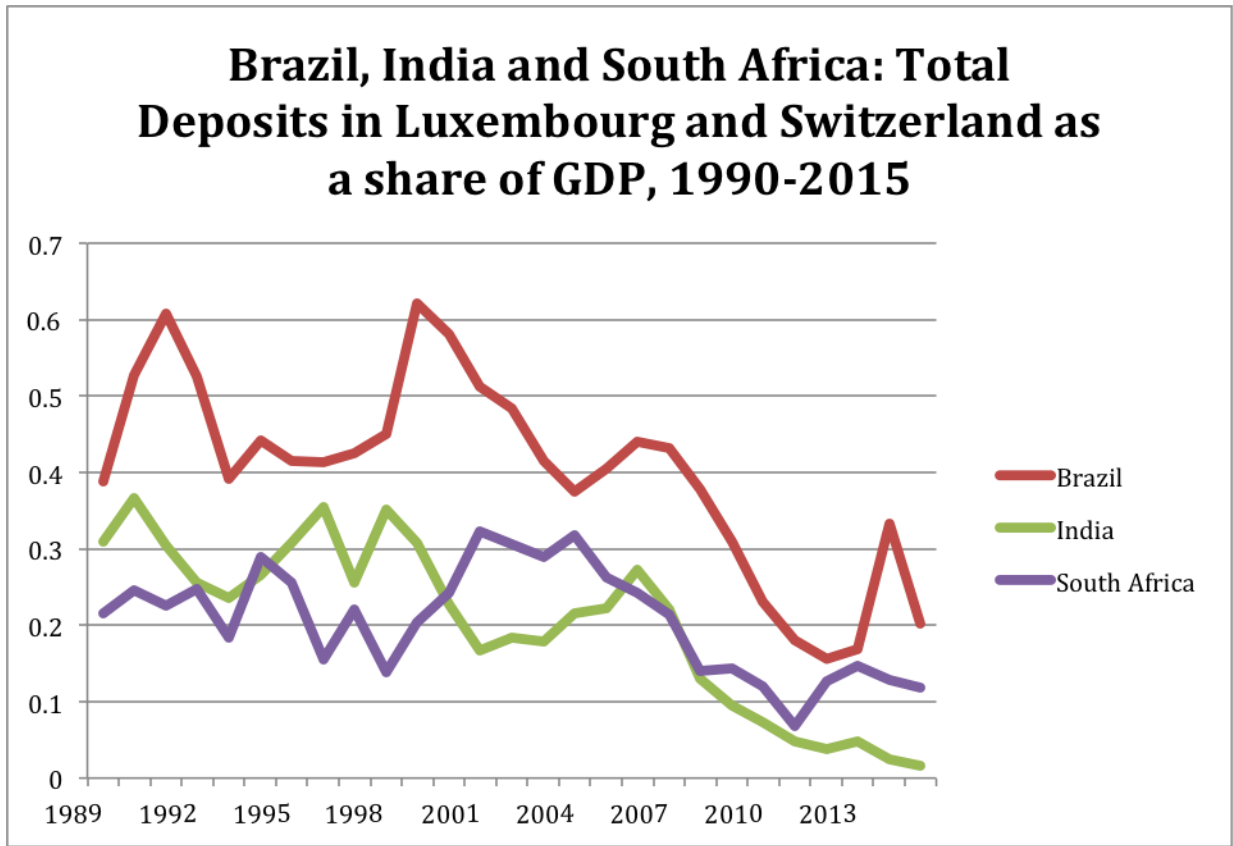


Figure 4

**Source** BIS Locational Statistics and World Bank GDP Statistics

**Notes** Calculated as the ratio of deposits of residents of Brazil, India and South Africa in Switzerland and Luxembourg to the GDP of each country, in Constant 2010 Dollars.

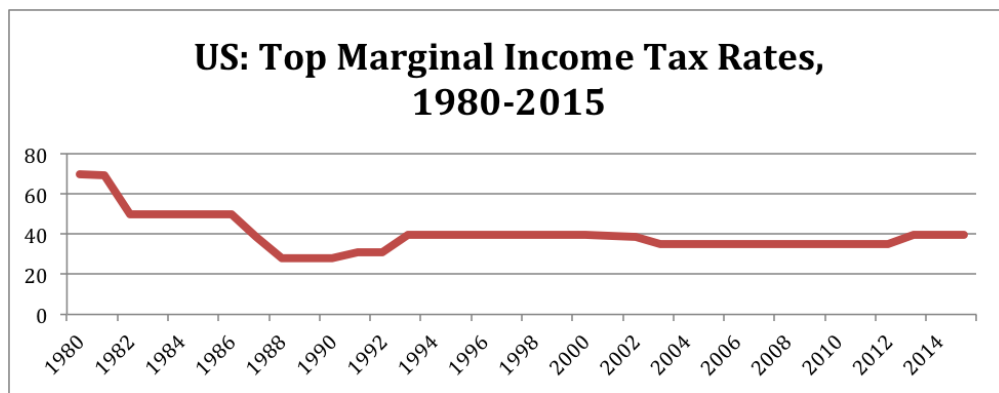


Figure 5

**Source:** OECD Tax Database

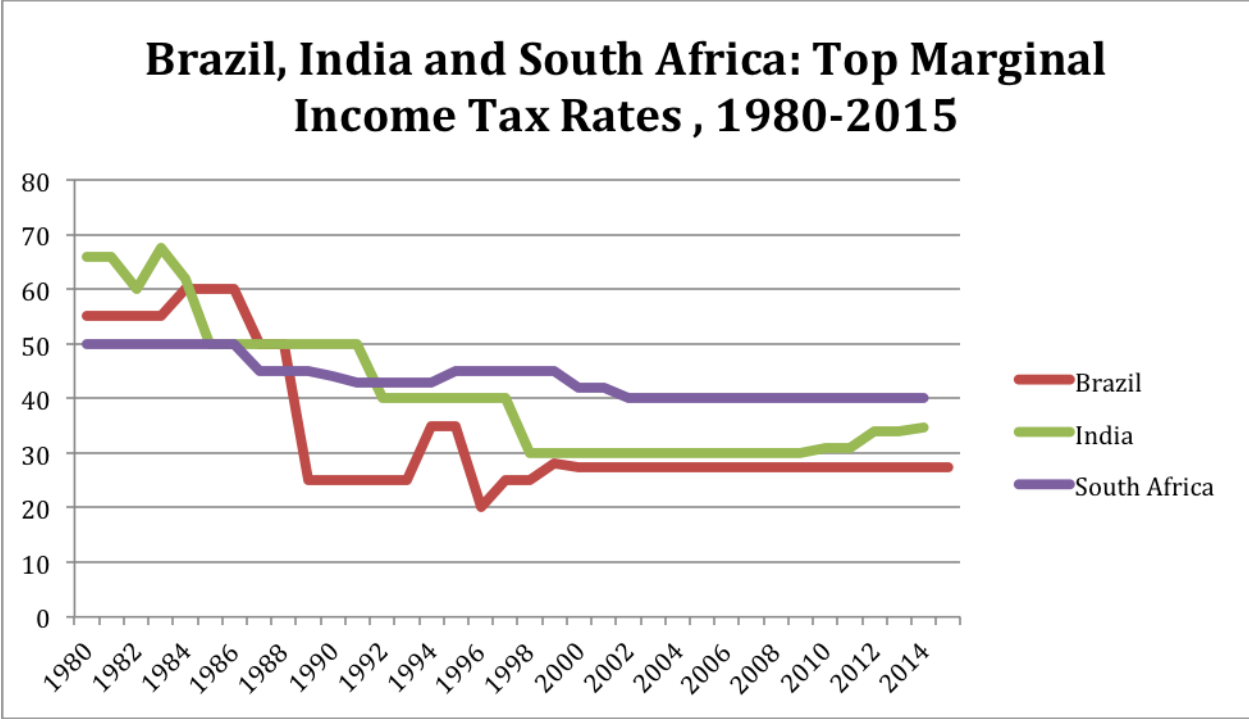


Figure 6

Source: KPMG and PWC Tax Summaries

## Literature Review

Tax evasion is a topic that has been studied extensively in the past. It has been studied at the level of individual tax-payers, at the level of firms, and from the perspective of the financial centers that aid in tax evasion. There is also a lot of literature on the determinants of cross-border flows and deposits in particular, which is what we are interested in. We will now take a brief look at some of the work that has been done in this field.

### A. Determinants of Tax Evasion

There have been several papers that have attempted to study the relationship between tax policy and tax evasion. For instance, Allingham and Sandmo (1974) study this relationship theoretically by modeling the taxpayer’s problem as a choice between reporting his actual income and declaring less than his actual income. If he chooses the latter, his payoff depends on whether or not he is investigated by the tax authorities. If he is not, then he is better off with the second way. But if he is investigated, then he is worse off. They conclude that there is a negative income effect (higher taxes make the taxpayer poorer and therefore less willing to

take risks) and a positive substitution effect (higher taxes encourage taxpayers to underreport their income) at play simultaneously, and thus the net impact of taxes on evasion is ambiguous.

Yitzhaki (1974) counters this model by arguing that the Allingham and Sandmo (1974) model was based on the assumption that the taxpayer has to pay a penalty rate on the undeclared income. If however, the penalty were on the evaded tax, then there is no substitution effect, and tax rate has a clear negative relationship with income.

Clotfelter (1983) studied this relationship empirically at an individual level by using the Internal Revenue Service's Taxpayer Compliance measurement program for 1969, consisting of observations of actual tax return data of individuals. The authors find that the elasticity of underreported income with respect to the marginal tax rates are positive and generally significant, indicating a positive relationship between tax evasion and tax rates. However they caution that their model is too simple to describe tax evasion behavior adequately. Tax compliance rates vary widely among income sourced and deductions from income, because of the numerous opportunities for misclassification of income and deductions and because the tax items used for understating taxable income are likely to vary from one person to another, and both of these possibilities complicate the analysis of individual tax returns.

Feinstein (1991) conducts an econometric analysis of income tax evasion and like Clotfelter (1983), uses data at an individual level from the IRS 1982 and 1985 Taxpayer Compliance Measure Programs. The author develops a model he calls fractional detection in the paper. This model consists of two equations. The first specifies taxpayer compliance behavior, which follows a tobit form, just like the model used by Clotfelter (1983). The second equation models the detection process, and assumes that the IRS examiner can detect some fraction of the evasion, rather than the all or none detection assumption that is commonly used in literature. The author finds that the likelihood and magnitude of evasion increases with taxpayer income and the marginal tax rate in both 1982 and 1985. With a pooled model over the two years, they find that income has a small and insignificant effect on evasion, while the marginal tax rate has a substantial negative effect. They also find that socioeconomic characteristics are significant. For instance, tax payers that own their own business or their own farm are much more likely to evade than the average taxpayer. They also find that variation in detection of evasion across examiners is a significant determinant of the magnitude of evasion. Then finally they attempt to construct the tax gap, which is an estimate of the total evasion in the U.S filer population, and estimate that the tax gap in 1987 was \$83.7 billion in the 1987 and \$63.4 billion in 1982.

Fisman (2004) studies the responsiveness of tax evasion to tax rates by examining evasion in China's imports from Hong Kong, at a disaggregated level, by comparing Hong Kong's reported exports and China's reported imports of the same products. They find that this gap in the two reports is highly correlated with

Chinese tax rates, and that there is more evasion at higher tax rates.

## **Discussion**

From these studies, it is apparent that the relationship between tax rates and tax evasion is complex, and the direction of impact that authors seem to find is extremely sensitive to the model, the specification and the sample being used.

## **B. Determinants of Cross-Border Financial Flows**

Cross-border finance has been studied in great detail by several authors in the past. For instance, Papaoianou (2008) studies the impact of institutions on cross-border bank lending, and finds a strong and robust relationship between well-functioning institutions and foreign bank flows. This paper combines financial bank flows to up to 140 countries from the mid eighties until 2002 with institutional proxies to study the impact of institutions on cross border bank lending. The authors find a robust relationship between well-functioning institutions and foreign bank flows, by employing both panel fixed effects and cross-sectional models. They also find similar results when they use instrumental variable techniques to account for endogeneity and measurement error.

Cummins, Hassett and Hubbard (1996) employ firm level data on tax reforms in 14 countries and find that tax reforms have an impact on investment patterns. They measure the effects of tax reforms on business investment using an extension of the tax adjusted  $q$  model. They argue that tax reforms are natural experiments for measuring the responsiveness for investment to fundamentals affecting the net return to investing, since they represent discrete events with a large and discernible effect on the return to investment.

Huizinga and Nicodeme (2001) study the determinants of international banking flows, and in particular focus on tax policy and information exchange. They study residence based interest income and wealth taxes that apply typically to worldwide income and wealth, and the efforts to enforce taxes by exchange of information. They also take into account withholding taxes, which are taxes applied to the interest payments in the source country. They find that interest income taxation increased international depositing, while international information exchange does not seem to have a strong impact on bilateral depositing, for the year 1999.

They use data at the bilateral level on external liabilities and deposits, from the BIS. The regression specification includes bilateral controls such as distance, common language etc, in addition to customer country and bank country variables (such as deposit and lending interest rates in each country). They run

two pooled cross-section regressions, for the period 1983-1999, and one for the period 1996-1999. In addition, they also run a cross-section regression only for the period 1999. In all regressions, non-tax control variables include each country's real GDP, its bank interest spread, its degree of rule of law and dummy variables identifying the origin of each country's legal system. The authors define bank spread as a measure of the spread between a banking system's lending and deposit interest rates, and it serves as an index for bank efficiency. They include income tax x deposit rate as a measure for the interest rate burden that the bank customer faces if he were to deposit at home. For the bank country, they include withholding tax x deposit rate as a measure of the withholding tax burden that the international bank customer faces in the bank country. They then run a similar set of regressions for the year 1999, and conclude that since external deposits are positively related to interest income and wealth taxes and to the presence of domestic bank interest reporting. The tax sensitivity of international deposits appears to be higher in 1999 than before, and they speculate that in response to the increased tax sensitivities, countries could have substantially reduced taxation of interest income in the last two decades.

### **C. Tax Evasion through the use of Tax Havens**

There have been a lot of studies on the use of Tax Havens by firms and corporations, however the use of tax havens for personal income tax evasion is still relatively an unexplored field. Johannesen and Zucman (2014) study the impact of the treaty signed by the G20 for exchange of bank information and they make use of a BIS dataset on bilateral deposits. They find that first of all, treaties have a statistically significant, but a relatively small, impact on bank deposits in tax havens. Secondly, they find that the treaties signed by tax havens do not lead to a significant decrease in the flow of funds to tax havens, but rather a relocation of deposits between tax havens. Empirically, they use a fixed effects regression, with country-pair fixed effects, and find a statistically significant impact of treaties on deposits in tax haven countries. They then explicitly model deposit-shifting behavior by introducing a treaty-coverage variable that, for each non-tax haven-tax haven pair counts the number of treaties signed by the non-tax haven country with all the other tax havens other than the one under consideration. They find that this variable is significant, which indicates that information sharing treaties lead to a relocation of deposits in tax havens.

We will be making use of a dataset similar to the one used by Johannesen and Zucman (2014), made available by the BIS, and adopting an econometric methodology that is similar to the one used by Huizinga and Nicodeme (2001). Zucman (2014) estimates that 8% of the world's financial wealth was in tax havens in 2013, and hence there is a clear need to understand the factors that determine the wealth held offshore.

## Empirical Methodology

We are interested in studying the role that top marginal income rates in a country have to play in determining the flow of deposits to offshore financial centers. Thus the main regression equation that we are interested in estimating is:

$$Liabilities_i = \beta_0 + \beta_1 Tax_{it} + \beta_2 CustomerCountry_i + \beta_3 BankCountry_i + \gamma CountryPair_i + \delta Year_t + \varepsilon_i$$

where:

*Liabilities* denotes the bilateral deposits and loans from the customer country to the bank country,

*Tax* denotes the income tax rate in the customer country,

*CustomerCountry* is the set of all customer country variables such as GDP, deposit interest rates and lending interest rates,

*BankCountry* denotes the set of bank country variables such as GDP, deposit interest rates and lending interest rates,

*CountryPair* denotes Country-pair fixed effects,

*Year* denotes dummies for each year.

Our empirical approach is very similar to the one adopted by Huizinga and Nicodeme (2001); in fact, we begin by attempting to their methodology (and to a certain extent, their results) for the year 1999. Next, we estimate this regression for a panel data set, comprising of data for 38 countries, and over a time period of 25 years. Since we are interested in particular about the deposits in tax haven countries, the next step in our empirical strategy would be to run the same regressions for the year 1999, but restrict the sample of reporting countries to only the tax haven countries. Following this, we would extend this cross-sectional analysis of OECD customer countries to all the countries in our dataset, and focus on running various specifications of country-pair fixed effects regression models.

## Data

### A. Deposits at the Bilateral Level

The Bank for International Settlements releases bilateral data on total liabilities reported by following offshore countries: Switzerland, Guernsey, Ireland, Jersey, Hong Kong, Luxembourg, Macao and the Isle of Man. We use bilateral data on outstanding liabilities from the last quarter for each year, for the time period 1980-2015.

In this study, we are concerned primarily with loans and deposits. However, the data that we have access

to does not break down total liabilities into its various components, and so we might be potentially concerned that using data on total liabilities is not an accurate representation of loans and deposits. However, we need not be overly concerned in this regard since liabilities are composed majorly of loans and deposits. This can be seen very clearly from Figure 7, which depicts the loans and deposits reported by the Cayman Islands at an aggregate level as a share of total liabilities reported. From the figure it can be clearly seen that deposits and loans have always been the largest components of total liabilities for the Cayman Islands, and this trend is also true for other tax haven countries in our sample. Thus the results we draw would be valid for deposits as well.

In this study, we are interested in personal income tax evasion, and hence, in particular, we are interested in looking at non-bank liabilities, and not at interbank loans and deposits. Non-bank liabilities, as defined by the BIS, refer to the liabilities of private or public financial institutions, other than banks, that are engaged primarily in the provision of financial services and activities auxiliary to financial intermediation such as fund management. Since we are interested in personal income tax evasion, we want to study the deposits made by households, which are part of the non-bank liabilities reported to the BIS.

## **B. Data on Tax Rates**

The data on marginal income tax rates comes from several sources, including the OECD website, KPMG tax reports, the World Tax Database created by the University of Michigan, and the Andrew Young School's World Tax Indicator database. The OECD database only contains data on the top marginal tax rates for Australia, Austria, Belgium, Chile, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom and the United States, and only starting from 2000. The World Tax Database contains the top marginal income tax rates for a greater sample of countries, including developing countries, starting from 1980, but only covers years until the early 2000s. KPMG tax reports contain data for almost all the countries in the sample starting from 2006, and for the early 2000s, to fill in the gaps, we use data from the World Tax Indicator database.

For these regressions, we do not include wealth tax rate as a regressor, since data on wealth taxes for emerging economies is sparse, especially for the earlier years in the time frame we are considering. However this does not pose a huge problem to our study, since wealth taxes are imposed only by a few countries, and are quite low. For instance, in 2015, only 11 countries imposed an inheritance and estate tax greater than 20%, while all the other OECD countries like Luxembourg, Australia, Austria, Canada, Sweden etc. did not

Table 1: Inheritance and Estate Tax Rates in Selected OECD Countries, 2015

Country	Tax Rate
Japan	55%
South Korea	50%
France	45%
United Kingdom	40%
United States	40%
Spain	34%
Ireland	33%
Belgium	30%
Germany	30%
Chile	25%
Greece	20%
Netherlands	20%
Finland	19%
Denmark	15%
Iceland	10%
Turkey	10%
Poland	7%
Switzerland	7%
Italy	4%
Luxembourg	0%
Serbia	0%
Slovenia	0%
Australia	0%
Austria	0%
Canada	0%
Estonia	0%
Israel	0%
Mexico	0%
New Zealand	0%
Norway	0%
Portugal	0%
Slovak Republic	0%
Sweden	0%
Hungary	0%
OECD Simple Average	15%

**Source:** Tax Foundation, EY Estate and Inheritance Tax



impose any inheritance or estate tax (Table 1).

For the next set of regressions, we use the tax/GDP ratio as our variable of interest. The tax/GDP ratio for comes from the OECD tax revenue database. Since the OECD database also has data on wealth tax/GDP ratio available, we include the wealth tax/GDP ratio as a regressor as well.

## C. Other Variables

The data on deposit interest rates and lending interest rates is from the World Bank and the IMF's International Financial Statistics database. The data on GDP has also been obtained from the World Bank database, while data on bilateral controls like distance, common language and a shared geographical border (contiguity) was taken from CEPII's database.

Furthermore, instead of using interest rates directly, similar to Huizinga and Nicodeme (2001), we used "interest rate spread", as a measure of the interest rate burden a bank customer has to face in their country. This was calculated as the log of the ratio of the lending rate to the deposit rate, for both the bank country and the customer country.

Table 1 reports summary statistics for all the variables.

# Results

## A. Cross-sectional model, OECD Countries, Year 1999

The first set of regressions that are reported in Table 3 are for a sample of OECD countries for the year 1999. Liabilities were regressed on the marginal income tax rate, the interest rate spread for both bank countries and customer countries, and bilateral controls like distance, a common language and a shared border. It can be seen from Table 3 that the coefficient on income tax is positive, suggesting that an increase in top marginal income tax rates of the customer country leads to an increase in bilateral deposits to the bank countries. More specifically, an increase in the marginal income tax rate by 1% leads to an increase in the deposits to bank countries by 0.8%. However this coefficient fails to be statistically significant. More interestingly, it can be seen that deposits were extremely sensitive to the interest rate spread of the bank country. The negative coefficient on the interest rate spread of the bank country indicates that a lower spread encourages individuals to deposit more. This is what we would expect since the interest rate spread is an indication of the interest rate burden, and a lower interest rate burden encourages depositors more. We also observe that the interest rate spread in the customer country has a positive coefficient, which indicates that a larger interest rate spread encourages depositors to take their money out of the country, which is again what we

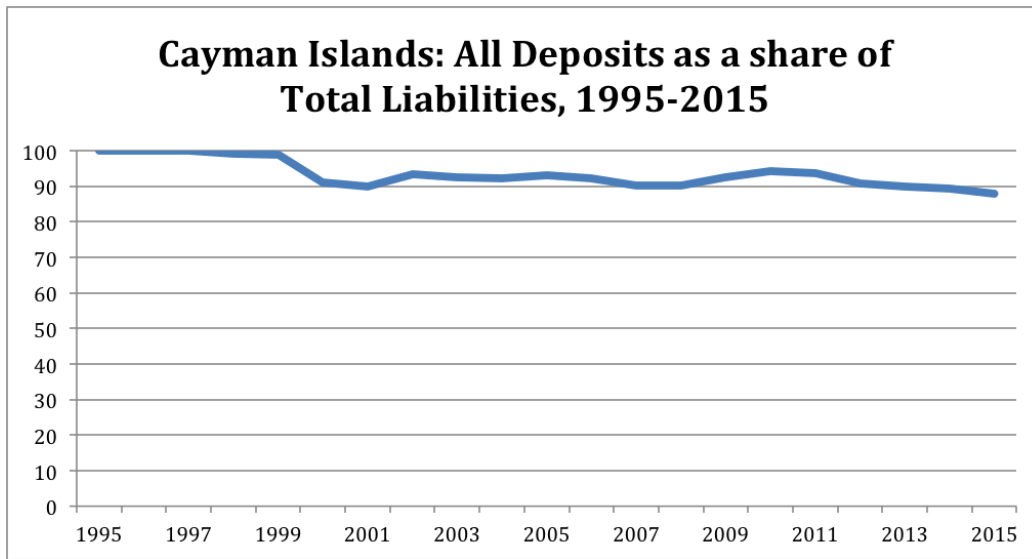


Figure 7

Source BIS Locational Statistics

Notes Ratio of Total Deposits to Total Liabilities for the Cayman Islands, from 1995-2015

Table 2: Summary Statistics

	Mean	SD	Min	Max
Liabilities (in millions of US Dollars)	1081.63	46583.9	0.00	909236
Bank Country Variables				
Deposit Rate (in %)	2.34	3.50	0.01	12.62
Lending Rate (in %)	8.04	11.23	2.68	43.96
GDP (in %)	1.89E+12	3.47E+12	3.28E+10	1.66E+13
Customer Country Variables				
Deposit Rate (in %)	3.44	3.93	0.01	14.92
Lending Rate (in %)	9.56327	8.52	2.68	43.96
GDP (in 2010 US \$)	1.43E+12	2.86E+12	4.54E+09	1.66E+13
Top Marginal Income Tax Rate (in %)	34.88	15.50	0	57
Income Tax/GDP	8.76	3.77	0.08	18.10
Wealth Tax/GDP	0.17	0.54	0	2.53
Bilateral Controls				
Distance (in kilometers)	7407.8	4729.95	173.03	19347.5
Contiguity	0.05	0.22	0	1
Common Language	0.15	0.36	0	1

would expect. The bilateral gravity controls, namely distance and contiguity, are also highly significant, which implies that an increase in the geographical distance between a country pair leads to a decrease in the flow of deposits, and a common shared geographical border increases the flow of deposits. Here distance can be interpreted as a proxy for information asymmetry and other unobservable transaction costs, and thus the relationship between distance and deposits makes sense. Furthermore, since distance has also been found to be a significant variable in the gravity models for trade, distance here could also be capturing part of the effect of trade on capital flows (Papaioannou 2004, p. 6). The GDP of the bank country is positive and significant, suggesting that a country receives more deposits as its size increases. Additionally, the GDP of the customer country is also positive and significant, suggesting that an increase in the size of the customer country leads to more bank flows out of the country. Perhaps, this is an indication of the fact that residents of richer countries have more opportunities to diversify, in terms of which country they choose to invest in, and for these individuals, perhaps investing in other similarly rich countries is attractive because of the greater diversification opportunities.

Reg(2) in Table 3 regresses non-bank liabilities on tax rates on the customer country variables alone. Again, the coefficient on income tax is positive, but very small and fails to be statistically significant, while the interest rate spread of the customer country continues to be positive. Gravity variables (in this case distance and a common language) can again be seen playing an important role in the determination of the level of international deposits.

Reg(3) in Table 3 includes only bilateral controls and income tax, and we see that the coefficient associated with income tax continues to be positive but statistically insignificant, while distance and a common language continue to be significant.

These baseline regressions indicate that income tax rates were not a significant determinant of deposits for a sample of OECD countries in the year 1999. The goal is to now extend this model to a larger sample of countries, consisting of both advanced and emerging economies, and perform a similar analysis first for the year 1999, and then over an extended time period, starting from 1980 to 2015. We are also going to restrict our sample of bank countries to only tax haven countries, in order to be able to better understand the role of income taxes in non-bank deposits in these countries.

## **B. Year 1999: Cross-sectional model for Customer Country-Tax Haven**

We now run the same regression for the extended sample of countries, restricting bank countries to tax havens, and using data from 1999, in order to observe the differences, if any, that exist in the patterns that

we had observed in the baseline regressions. Due to a degrees of freedom constraint because of the limited number of data points for this particular cross-section of data, we modified the baseline regression model by not including the bank country variables in the first regression, and in the second regression two of the bilateral controls, namely common language and contiguity. The results of these regressions are presented in Table 4.

From Regression 1 in Table 4, it can be seen that the top marginal income tax rate has a very small, but positive association, with the deposits in offshore countries. However it fails to be statistically significant. Deposits in tax havens are sensitive to the interest rate spread in the bank country, and the negative coefficient indicates that an increase in the interest rate burden by 1% reduces deposits in offshore countries by 0.133%. Under the modified regression specification of Reg(2) in Table 4, it can be observed that the top marginal income tax rate has a negative coefficient, however it is not statistically significant. In order to investigate this further, we turn from running a cross-sectional regression to a pooled model. The results of this regression are reported in Table 3.

### **C. 1980-2015: Pooled Regression for Customer Country-Tax Haven Country Pair**

Regression 1 in Table 5 does not account for individual country fixed effects, the second regression includes bank country dummies in addition to time dummies, and includes only customer country variables as regressors, and the third regression only includes the bilateral controls, in addition to the marginal income tax rates, as regressors and also includes time dummies, bank country dummies and customer dummies. The first regression gives us a significant, positive effect of income tax rates on deposits in offshore countries. However since this regression does not include country fixed effects, we are not accounting for the intrinsic factors in each country that influence both tax rates and deposits in tax havens, and this could potentially be biasing our results. Hence, in Reg(2) of Table 5, we include bank country fixed effects with the customer country variables alone. We observe that income tax rates continue to be significant and positive, indicating that an increase in the marginal income tax rate by 1% leads to an increase in the deposits in tax haven countries by 1.03%. The GDP of the customer country is also positive and significant, as are the bilateral controls. Deposits continue to be sensitive to interest rates in this specification. In the third regression, we include only the bilateral controls and the marginal income tax rate as a regressor, and we include both bank country and customer country dummies. We now observe that although the income tax rate has a positive coefficient, it is no longer statistically significant. However distance and common language are significant in

this regression.

Since bilateral controls have been consistently significant in all the regression specifications thus far, there seems to be merit to the idea that bilateral factors play an important role in determining the level of deposits in a tax haven country.

#### **D. 1980-2015: Country Pair Fixed Effects**

We now turn to a specification that controls for differentials between countries in each country pair by including country-pair fixed effects. By including country-pair fixed effects, we are accounting for the time-invariant differentials between countries such as distance, language, contiguity, historical relations between the country, differences in origins of law, etc. We are also controlling for other unobservable differentials that may impact both income tax rates in the customer country and the deposits in the tax haven. By controlling for these time-invariant variables, we can draw the conclusion that any change in deposits in offshore banks is caused purely by a change in one of our predictor variables. Similarly, since there might be time-related factors and time trends that impact deposits to tax havens from customer countries in a similar manner, by including time dummies, we are able to account for these time trends.

Since we are also interested in comparing the results for developed countries with those for developing countries, we report three specifications for each of the empirical models that follow—the first specification is for the entire sample, the second specification is restricted to only advanced economies, while the third specification is restricted to emerging economies. As before, all the regressions include the deposit interest rate, the lending interest rate, and the GDP for each country in any given country pair. The results of these regressions are in Table 6.

From the first regression, which is for all the countries in our sample, we observe that coefficient on income tax is positive, but not significant. The interest rate spread of the bank country is positive, which is rather unexpected, since it suggests that a larger spread encourages more deposits to the bank country. This could perhaps be because of other confounding factors that are biasing our coefficients for the interest rate spread of the bank country. Interestingly, none of these variables are significant in the Reg(2) and Reg(3), which are restricted to advanced countries and emerging economies alone, respectively.

Thus from the country-pair fixed effects regressions estimated above, it seems as though income tax rates do not have a significant impact on deposits, which agrees with the result we had obtained in the regression with bank country and customer country fixed effects (Table 4). In order to test the robustness of this result, we run more specification of this regression below.

## **E. 1980-2015: Country Pair Fixed Effects with Tax to GDP Ratios**

Since it is possible that an increase in tax rates is accompanied by a change in the tax base (or the taxable income), the marginal tax rates doesn't accurately depict the burden of the tax. In order to better understand the impact of the tax burden on the decision to move funds to tax funds, we run another set of regressions for the panel dataset with the income tax to GDP ratio as a proxy for the income tax burden on the tax-payer. In other words, the tax-GDP ratio can be seen as a proxy for the effective income tax rate, and if the effective tax rate is significantly lower than the marginal tax rate, it is possible that the marginal tax rate doesn't paint an accurate picture of the relationship between tax rates and deposits to tax haven countries.

From Table 7, it can be seen that the results we obtain this time are a little different from what was obtained previously. We now see that the "effective" income tax rate is negative in the first and last specification. For the third specification in particular, this implies that if the income tax to GDP ratio increases by one unit, the households in emerging economies decrease their deposits to tax haven countries by 12.5% . In other words, if the tax burden or the effective tax rate increases, deposits to offshore countries decrease. However this coefficient is not significant for any of the specifications. Additionally, we observe that the wealth tax burden is not significant in any of the regressions, perhaps because of the fact that it is imposed only by a few countries and is usually quite low. And finally, as in the previous regressions, the GDP of the bank country is highly significant.

If we were to compare regression tables 6 and 7, we can see that the results presented in Table 5 seem to indicate the possibility of a negative relationship between the tax burden and effective tax rates, particularly for developing countries. However we fail to reject the hypothesis that these results are statistically significant from zero, and so our results agree with the ones obtained in the previous specifications in Table 4, to the extent that tax rates are not a significant determinant of deposits.

## **F. 1980-2015: Country Pair Fixed Effects with Lagged Income Tax Rate as a Regressor**

We next run the same regression with time-lagged tax variables, in order to account for the case where an individual's decision to deposit in a tax haven country is driven by the tax rates in the past. In such a case, the deposits held in tax haven countries this year would be determined by the tax rates in the year before. The results of this regression are presented in the tables 8. In Table 8, we use income tax, lagged by a single year, as a regressor. From the results of the first regression in Table 8, it seems as though the results are not different from what we had obtained previously by using the marginal income tax rates in time  $t$  as a regressor, which indicates that the top marginal income tax rate of the previous year (time  $t-1$ ) does not have

play a significant role in determining an individual's decision to deposit in a tax {haven country. However in Regression (2), we observe that the lagged tax variable is significant for the deposits for the advanced economies. That is to say, for advanced economies, a 1% increase in the income tax rates in the preceding year leads to a 1.02% increase in deposits in tax havens. Interestingly, for developing countries we find a much smaller impact of the lagged tax variable, which is moreover not significant.

## Discussion

### Exogeneity of Tax Rates

In the previous section, we tried several specifications of our model. The next question that we must ask is, which model is the best suited to study the question we are interested in? We would argue that the specifications that include country-pair fixed effects are the most appropriate way to model this problem. This is because by using country-pair fixed effects, we are able to ensure that the marginal tax rate is exogenous, and thus the effect that we find is indeed causal.

The most common causes of exogeneity are measurement errors, simultaneous causality and omitted variable bias. Let us look at each of these potential problems that may be biasing our results.

1. Measurement Errors: Since we are considering the top marginal tax rate (except for Subsection E in the previous section) in our specifications, we do not need to worry about any misreporting or measurement errors in tax rates that may possibly bias our results.

2. Simultaneous Causality: This is not a major concern, since tax rates in the current year will not be determined by the deposits in tax havens at the end of the year. Since the change in tax rates for a given year occurs before data on outstanding liabilities in the last quarter of the year are collected, there is no possibility of a reverse causation.

3. Omitted Variable Bias: An omitted variable in the error term can bias our coefficients only if it is correlated with both tax rates and liabilities. However, by including country-pair fixed effects, we are able to control for any such factors, since the factors that are correlated with tax rates and liabilities must be intrinsic to the country-pair (such as the relationship between a country pair, a common political origin etc).

Thus by making use of country-pair fixed effects, we are able to arrive at estimates that are causal by design.

## **The Effect of Income Tax on Deposits: Some Economic Explanations**

From the regressions above, the effect of income tax rates on deposits is not significant in most specifications. On the one hand, we obtain positive results with marginal income tax rates, and on the other hand, we obtain negative results with effective tax rates for developing countries, and positive results for advanced economies. And finally, with a lagged tax variable, we obtain a small, positive and significant effect for advanced economies. There are several possible explanations that we could give to explain the lack of a significant association between tax rates and deposits.

One of the reasons for the positive coefficient would be the most obvious channel between income tax rates and deposits, that higher marginal income tax rates encourage wealthy individuals and households to evade taxes by directing their deposits to tax haven countries. However, perhaps this effect is not statistically significant because our dataset is restricted to a limited number of tax haven countries. Furthermore, as modeled by Allingham and Sandmo (1974), there is both a negative income effect associated with higher tax rates, which makes individuals less willing to take risks, as well as a positive substitution effect of higher taxes encouraging taxpayers to evade taxes. Perhaps, for our sample of countries, these two effects were nearly equal, and hence we fail to reject the hypothesis that the impact of the tax rates on deposits is significantly different from 0.

We might also be worried about potential bias in our estimates. For instance, if there are country-specific events that are not time invariant and occur at the same time as the changes in tax rates, and these events perhaps affect deposits as well, and hence bias our coefficients. For instance, perhaps there was a massive revamp in financial infrastructure that the government decided to fund by raising income tax rates. Such an event would impact both deposits in offshore countries by domestic residents and the tax rates set by the government, and this could potentially bias our results, and give us insignificant coefficients.

Another possible explanation is that perhaps it became easier to evade taxes within these countries themselves, so there was no need to move deposits overseas. For instance, if the shadow banking sector grew more efficient at the same time as a change in tax rates, or if a change in regulations made it easier to start shell corporations to redirect income, it is possible that our estimate would be biased.

### **Shortcomings of the BIS dataset**

There are several limitations associated with the BIS dataset. First of all, bilateral data is limited only to a few tax haven countries. Data for several large tax havens, for instance the Bahamas, Bahrain, Singapore and the Cayman Islands, is available only at an aggregate level. And so the conclusions we draw are limited to the small group of tax havens we have data on. However, since we are using data at a bilateral level, and these missing tax havens function very similarly to the tax havens in our sample, we would most likely arrive



at the same conclusion.

Secondly, the BIS data is based on immediate ownership, and does not account for the cases where individuals create shell corporations in tax havens and then conduct their financial operations, including depositing in other tax havens, through these corporations. Figure 7 shows the deposits that each of the tax havens in our sample received from other tax havens as a share of total cross-border deposits that they received in the last quarter of 2015. Switzerland received almost 38% deposits from other tax havens, while Luxembourg received around 32%. While these numbers do not accurately represent the extent to which sham corporations are used for tax evasion activities, it is an indication of the fact that the use of sham corporations is wide spread, because residents in tax havens do not have as much incentive to divert their deposits to other tax havens, as do citizens of non-tax haven countries.

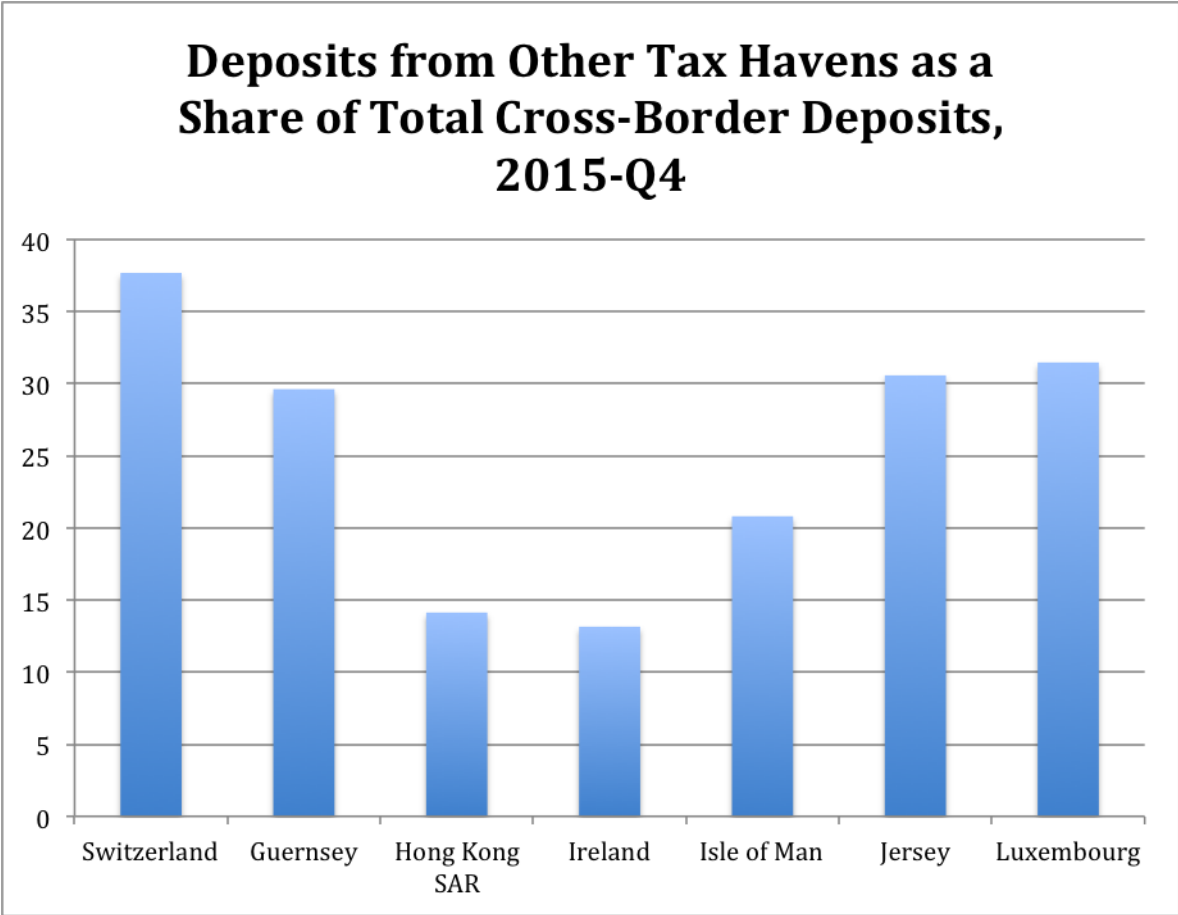


Figure 7

**Source:** BIS Locational Statistics

**Notes:** Constructed as the ratio of non-bank deposits received by each tax haven in total from other tax havens, and the total non-bank liabilities reported by each tax haven

## Improvements in the Model and Scope for Future Research

Since the data we use varies over time, it is possible that the error terms in the regression are autocorrelated. In the case we find evidence for autocorrelation, we could correct our model by using Generalized Least Squares estimators.

The other caveat in our interpretation of our results is that we assume that while there may exist a threshold such that any tax rate above this threshold encourages tax payers to deposit in tax havens, the tax planner has no information regarding the threshold. This assumption is critical to our identification strategy, because if this is violated, then our identification strategy would no longer be accurate. In other words, since we are assuming that the only factors that determine both tax rates and deposits originate from time invariant factors that are unique to the country pair, such an information variable would be an omitted variable that would render our estimates non-causal. While this assumption seems to be a rather big assumption to make, it is not all that unrealistic, since previous studies in this field have not found clear and unambiguous evidence for the existence of such a threshold. However for future studies it might be a useful endeavor to model this information variable from the perspective of the tax planner in order to see how our results would then change.

An interesting question to next study could be regarding the determinants of the flow of deposits to offshore countries, rather than the level of deposits. By looking at the flow of deposits offshore, perhaps we would be able to draw conclusions about an individual's decision to move funds offshore, which also would be very useful for policy makers.

Also, based on our last regression specification with lagged income tax rates, it might seem that the responsiveness of advanced countries is different from that of emerging economies, to tax rates. It would be useful to design a model that could test this hypothesis. For instance, a simple modification that can be done is to have the factors that distinguish advanced economies from emerging economies interact with tax rates, and then test the significance of these interaction terms.

## Conclusion and Broader Implications

In the previous section, we tried running several specifications of our model in order to understand the relationship between deposits in tax haven countries and personal income tax better. When we run the regression with just bank country or customer country fixed effects, we obtain positive results. However when we make use of country-pair fixed effects, we see that the effect of marginal tax rates is positive, but not statistically significant. When we tried to use the tax/GDP ratio as a proxy for the effective tax

rate in order to be able to measure the impact of the effective tax burden on deposits, we observed that the coefficient is positive for advanced economies and negative for emerging economies, but neither is statistically significant. In addition, we attempted to measure the impact of the income tax rates in previous years on the decision to deposit in an offshore country in the present, and found a small positive significant effect for advanced economies, while the results for developing countries were similar to our previous results. These results lead us to the conclusion that the relationship between income tax rates and deposits in offshore countries is sensitive to the specification being used and the effect of an increase in tax rates on evasion is mostly insignificant.

This insignificant relationship between income tax rates and international deposits to offshore countries has several policy implications. From the results we have obtained in this paper, it is clear that reducing marginal income tax rates is not going to result in a decline in the outflow of funds to offshore financial centers, especially for developing countries. For advanced economies, there is evidence that tax rates in the previous year determine deposits in the following year, but it still a small effect.

The interesting question that then arises is: If marginal income tax rates don't have a clear decisive role to play in determining deposits in offshore countries, then what could the other potential determinants of deposits be? Perhaps factors like bank secrecy, political instability, exchange rate stability, inflation, the development of the domestic banking sector are more important determinants than the income tax rates in an individual's decision to deposit offshore. The other question also worth asking is—are deposits to tax havens really indicative of an individual's decision to evade taxes? Perhaps deposits to offshore countries are simply a way to move funds out of the country in order to be able to invest them in other financial instruments, and perhaps tax evasion is not the goal after all. For instance, at the beginning of the paper, we spent quite a bit of time examining the various other operations that offshore financial centers specialize in—it is possible that wealthy individuals and households use tax havens more for these purposes, and less for the purpose of income tax evasion, in which case, the result we obtained would not be as surprising.

In recent times, there has been a lot of talk about reducing the top marginal income tax rates. However such a policy would not impact the flow of funds out of the country into offshore accounts, and would only end up increasing the divide between the rich and the poor. Thus to combat tax evasion by wealthy individuals, there is a need for policy initiatives that do not focus solely on income tax rates, but also on other determinants of deposits in tax havens.

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# APPENDIX: List of Regression Tables

Table 3: Cross-section, OECD Countries, Year 1999

	(1)	(2)	(3)
	Liabilities	Liabilities	Liabilities
Income Tax	0.00822 (0.0133)	0.0103 (0.0150)	0.0106 (0.0147)
Interest Rate Spread, Bank Country	-1.115*** (0.225)		
GDP, Bank Country	0.970*** (0.138)		
Interest Rate Spread, Customer Country	0.133 (0.309)	0.295 (0.388)	
GDP, Customer Country	0.351** (0.163)	0.432** (0.191)	
Distance	-0.667*** (0.133)	-0.684*** (0.158)	-0.582*** (0.165)
commlang	0.551 (0.483)	1.817*** (0.630)	2.069*** (0.599)
contig	0.930** (0.408)	-0.105 (0.695)	-0.250 (0.733)
Constant	-25.47*** (5.102)	-2.111 (4.734)	9.486*** (1.523)
Observations	108	140	158
Adjusted $R^2$	0.532	0.242	0.157

Robust clustered standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Notes  $Liabilities_{ij} = \beta_0 + \beta_1 TaxRate_j + \beta_2 BankSpread_i + \beta_3 BankGDP_i + \beta_4 CustomerSpread_j + \beta_5 CustomerGDP_j + \beta_6 Dist_{ij} + \beta_7 Contig_{ij} + \beta_8 CommLang_{ij} + \varepsilon_{ij}$

(i represents the bank country, j represents the customer country)

Reg(1) uses all variables, Reg(2) makes use only of customer country variables, Reg(3) makes use only of bilateral controls.

Liabilities and GDP are in logs, Tax Rates are in percentages (between 0-100), Distances are in kilometers, Contig and CommLang are dummy variables (either 0 or 1)

Table 4: Cross-section, Customer Country-Tax Haven Country Pair, Year 1999

	(1)	(2)
	Liabilities	Liabilities
Income Tax	0.00134 (0.0194)	-0.0127 (0.0227)
Interest Rate Spread, Bank Country	-1.606*** (0.188)	
Interest Rate Spread, Customer Country	-0.453 (0.405)	-0.368 (0.434)
GDP, Customer Country	0.594*** (0.190)	0.490*** (0.183)
Distance	-0.535** (0.208)	-0.452* (0.251)
CommLang		-0.519 (0.717)
Contig		3.422*** (0.949)
Constant	-2.216 (4.887)	-3.333 (5.065)
Observations	61	93
Adjusted $R^2$	0.607	0.300

Robust clustered standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Notes:  $Liabilities_{ij} = \beta_0 + \beta_1 TaxRate_j + \beta_2 BankSpread_i + \beta_3 BankGDP_i + \beta_4 CustomerSpread_j + \beta_5 CustomerGDP_j + \beta_6 Dist_{ij} + \beta_7 Contig_{ij} + \beta_8 CommLang_{ij} + \varepsilon_{ij}$

(i represents the bank country, j represents the customer country)

Reg(1) uses both bank and customer country variables, Reg(2) makes use only of customer country variables, Reg(3) makes use only of bilateral controls.

Liabilities and GDP are in logs, Tax Rates are in percentages (between 0-100), Distances are in kilometers, Contig and CommLang are dummy variables (either 0 or 1)



Table 5: Pooled Regression, 1980-2015

	(1)	(2)	(3)
	Liabilities	Liabilities	Liabilities
Income Tax	0.00949** (0.00368)	0.0103*** (0.00298)	0.00289 (0.00256)
Interest Rate Spread, Bank Country	-1.059*** (0.0546)		
GDP, Customer Country	0.301*** (0.0350)	0.371*** (0.0287)	
Interest Rate Spread, Customer Country	0.321*** (0.0879)	0.418*** (0.0598)	
GDP, Bank Country	0.432*** (0.0428)		
Distance	-0.564*** (0.0418)	-0.648*** (0.0322)	-1.087*** (0.115)
commlang	0.762*** (0.135)	1.098*** (0.102)	0.350*** (0.111)
contig	1.644*** (0.187)	0.706*** (0.178)	0.230 (0.143)
Observations	1935	2521	3693
$R^2$	0.548	0.621	0.810
Adjusted $R^2$	0.537	0.614	0.806
Time Dummies	Yes	Yes	Yes
Bank Country Dummies	No	Yes	Yes
Customer Country Dummies	No	No	Yes

Robust clustered standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Notes:  $Liabilities_{ijt} = \beta_0 + \beta_1 TaxRate_{jt} + \beta_2 BankSpread_{it} + \beta_3 BankGDP_{it} + \beta_4 CustomerSpread_{jt} + \beta_5 CustomerGDP_{jt} + \beta_6 Dist_{ij} + \beta_7 Contig_{ij} + \beta_8 CommLang_{ij} + \gamma_i CustomerCountry_i + \delta_j BankCountry_j + Year_t + \varepsilon_{ijt}$

(i represents the bank country, j represents the customer country)

Reg(1) uses both bank and customer country variables, and only time dummies, Reg(2) makes use only of customer country variables and uses bank country dummies and time dummies, Reg(3) makes use only of bilateral controls, and uses bank country dummies, customer country dummies and time dummies.. Liabilities and GDP are in logs, Tax Rates are in percentages (between 0-100), Distances are in kilometers, Contig and CommLang are dummy variables (either 0 or 1)

Table 6: Country-Pair Fixed Effects Regressions, 1980-2015

	(1)	(2)	(3)
	All	Advanced	Emerging
Income Tax	0.00409 (0.00505)	0.00808 (0.00578)	0.00283 (0.0102)
Interest Rate Spread, Bank Country	0.141* (0.0766)	0.130 (0.107)	0.113 (0.0896)
Interest Rate Spread, Customer Country	0.0934 (0.106)	0.153 (0.125)	-0.287 (0.176)
GDP, Customer Country	0.322 (0.486)	0.884 (0.661)	0.266 (0.618)
GDP, Bank Country	0.278 (0.408)	0.594 (0.410)	-0.266 (0.840)
Observations	2087	1057	1030
$R^2$	0.678	0.752	0.590
Adjusted $R^2$	0.672	0.743	0.574
Time FEs	Yes	Yes	Yes
CountryPair FEs	Yes	Yes	Yes

Robust clustered standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Notes:  $Liabilities_{ijt} = \beta_0 + \beta_1 TaxRate_{jt} + \beta_2 BankSpread_{it} + \beta_3 BankGDP_{it} + \beta_4 CustomerSpread_{jt} + \beta_5 CustomerGDP_{jt} + \lambda_{ij} CountryPair_{ij} + Year_t + \varepsilon_{ijt}$

(i represents the bank country, j represents the customer country)

Reg(1) uses a pooled sample of all countries across all years, Reg(2) uses only advanced economies in the sample, Reg(3) uses only emerging economies in the sample.

Liabilities and GDP are in logs, Tax Rates are in percentages (between 0-100), Distances are in kilometers, Contig and CommLang are dummy variables (either 0 or 1)

Table 7: FE Regressions with Effective Tax Rates, 1980-2015

	(1)	(2)	(3)
	All	Advanced	Emerging
Effective Income Tax Rate	-0.00397 (0.0332)	0.000624 (0.0396)	-0.0535 (0.0774)
Effective Wealth Tax Rate	-0.133 (0.471)	0.0954 (0.530)	-0.459 (0.533)
Interest_Rate_Spread_Bank	0.0953 (0.0910)	0.122 (0.125)	-0.0133 (0.0885)
GDP_Bank	1.446*** (0.466)	0.859* (0.449)	3.655*** (1.208)
Interest_Rate_Spread_Customer	0.156 (0.110)	0.141 (0.136)	0.101 (0.230)
GDP_Customer	-0.198 (0.486)	0.627 (1.012)	-0.436 (0.477)
Observations	1520	926	594
$R^2$	0.677	0.740	0.448
Adjusted $R^2$	0.668	0.728	0.417
Time FEs	Yes	Yes	Yes
CountryPair FEs	Yes	Yes	Yes

Robust clustered standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Notes:  $Liabilities_{ijt} = \beta_0 + \beta_1 IncomeTax/GDP_j + \beta_2 WealthTax/GDP_j + \beta_3 BankSpread_{it} + \beta_4 BankGDP_{it} + \beta_5 CustomerSpread_{jt} + \beta_6 CustomerGDP_{jt} + \lambda_{ij} CountryPair_{ij} + Year_t + \varepsilon_{ijt}$

(i represents the bank country, j represents the customer country)

Reg(1) uses a pooled sample of all countries across all years, Reg(2) uses only advanced economies in the sample, Reg(3) uses only emerging economies in the sample.

Liabilities and GDP are in logs, Income Tax to GDP ratio and Wealth Tax to GDP Ratio are in percentages (between 0-100), Distances are in kilometers, Contig and CommLang are dummy variables (either 0 or 1)

Table 8: FE Regressions with Lagged Tax Variable, 1980-2014

	(1)	(2)	(3)
	All	Advanced	Emerging
Income Tax Rate, Previous Year	0.00602 (0.00487)	0.0102* (0.00517)	0.00403 (0.0101)
Interest Rate Spread, Bank Country	0.127* (0.0729)	0.118 (0.104)	0.104 (0.0868)
GDP, Bank Country	0.427 (0.407)	0.781* (0.398)	-0.183 (0.864)
Interest Rate Spread, Customer Country	0.0665 (0.107)	0.125 (0.119)	-0.279 (0.177)
GDP, Customer Country	0.248 (0.514)	0.854 (0.703)	0.194 (0.652)
Observations	2042	1022	1020
$R^2$	0.671	0.746	0.588
Adjusted $R^2$	0.665	0.736	0.572
Time FEs	Yes	Yes	Yes
CountryPair FEs	Yes	Yes	Yes

Robust clustered standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Notes  $Liabilities_{ijt} = \beta_0 + \beta_1 IncomeTaxRate_{j(t-1)} + \beta_2 BankSpread_{it} + \beta_3 BankGDP_{it} + \beta_4 CustomerSpread_{jt} + \beta_5 CustomerGDP_{jt} + \lambda_{ij} CountryPair_{ij} + Year_t + \varepsilon_{ijt}$ ;

i represents the bank country, j represents the customer country

Reg(1) uses a pooled sample of all countries across all years, Reg(2) uses only advanced economies in the sample, Reg(3) uses only emerging economies in the sample.

Liabilities and GDP are in logs, Distances are in kilometers, Contig and CommLang are dummy variables (either 0 or 1),  $IncomeTaxRate_{j,(t-1)}$  denotes the tax rate of the previous year for country j.