

Swiss Bank Accounts

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Abstract: We examine the origin of deposits with Swiss banks on a country-by-country basis for the period 1987-2007. We relate the volume of Swiss bank deposits for 99 countries to the taxation of personal income as well as to political governance in these countries. Our results suggest that higher taxation in origin countries is not associated with a larger volume of deposits with Swiss banks. Our results do show however that countries with weak political governance, e.g. corruption, internal conflict, instable government, not only have a higher volume of deposits with Swiss banks but also a higher share of their total cross-border deposits in Switzerland. Looking at the impact of recent policy changes in Switzerland to counter tax evasion we find that the introduction of a withholding tax on deposits held by EU residents at Swiss banks in 2005 has had a significant impact. By contrast, the Swiss anti-money laundering act introduced in 1998 does not seem to have reduced the volume of Swiss bank accounts from countries with weak governance.

Keywords: Offshore banking, Tax evasion, Political governance, Anti-money laundering.

JEL Codes: F3, G2, H2, K4

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1. Introduction

The role of offshore financial centers in enabling tax evasion is at the forefront of economic and foreign policy in most OECD countries. The substantial increase in government debt in the wake of the recent financial and economic crisis has intensified international pressure on offshore centers towards preventing tax evasion. In September 2009, for example, the Global Forum on Transparency and Exchange of Information for Tax Purposes was given the mandate to overview the implementation of the OECD standards on the exchange of information related to tax evasion.¹

Switzerland is widely held to be one of the world's most important offshore financial centers and has consequently been at the heart of recent debates on tax evasion. In March 2009 the OECD considered placing Switzerland on a list of countries that do not fully adhere to OECD standards in tax related information exchange. In November 2008 the US Internal Revenue Service (IRS) threatened to take legal action against UBS, the largest Swiss bank, for encouraging US residents to move their assets offshore and conceal them from U.S. tax authorities. Switzerland has subsequently negotiated a treaty with the USA and a range of OECD countries, facilitating the exchange of information on potential tax evaders holding accounts with Swiss banks.

Weak political governance in origin countries and money laundering are considered to be another key determinant of offshore banking. In the past, Swiss banks have been found to harbor substantial assets of corrupt regimes from developing countries, e.g. Duvalier (Haiti), Marcos (Philippines) or Abacha (Nigeria). The recent political turmoil in the Maghreb region has also highlighted the potential role of offshore financial centers in enabling regimes to exploit the resources of their home country. More recently Swiss authorities have taken

¹ <http://www.oecd.org/dataoecd/32/45/43757434.pdf>

measures to block assets related to the entourage of the former Presidents of Tunisia (Ben Ali), Egypt (Mubarak) as well as of the Ghadaffi regime (Libya).²

While there is little doubt that offshore financial centers, like Switzerland, enable tax evasion and money laundering, the existing empirical evidence is unclear on how important these effects are economically. Evidence by Huizinga and Nicodème (2004), for example, suggests that while taxation had a substantial impact on cross-border bank deposits in the 1980's, this effect became negligible during the 1990's. Moreover, to our knowledge there is no empirical evidence to date which identifies to what extent countries with weak political governance have larger volumes of deposits in offshore financial centers.

In this paper we use a unique dataset on foreign deposits with Swiss banks to examine the relation between taxation and political governance in origin countries on one side and offshore deposits on the other. Our dataset includes annual volumes of deposit accounts and fiduciary accounts with Swiss banks on a country-by-country basis for 99 countries over the period 1987-2007. We relate this information to the total cross-border deposits of each country, as reported by the Bank for International Settlements (BIS), so that we can identify not only the *volume* of deposits of each origin country in Switzerland, but also what *share* of their total cross-border deposits is held in Switzerland. We relate the country-level volume and the share of deposits in Switzerland to the taxation of personal income as well as to political governance in each country.

Our cross-sectional and panel estimations yield two main results: First, we find that higher taxation in an origin country is not associated with a larger volume of deposits with Swiss banks or with a larger share of cross-border deposits in Switzerland. Second, we do find that countries with weak political governance, e.g. corruption, internal conflict, instable

² <http://www.eda.admin.ch/eda/en/home/topics/finec/intcr/poexp.html>

government, not only have a higher volume of deposits with Swiss banks but also a higher share of their total cross-border deposits in Switzerland. This finding is particularly strong in our full sample of OECD and non-OECD countries.

We also examine the impact of recent changes in the legal and tax conditions in Switzerland. We find that the introduction of a 15% withholding tax in 2005 on the interest income earned by EU nationals on fiduciary accounts with Swiss banks led to a significant reduction in such accounts. This result is consistent with our earlier finding that tax evasion is not the primary motive for foreign residents to deposit funds with Swiss banks: Foreign residents may move funds to the Swiss financial centre for a multitude of other motives, but once these funds are in Switzerland they do choose to invest in tax-minimizing assets. Alternatively, this result could also imply that, due to threshold effects our analysis of taxation in origin countries does not pick up the role of tax evasion in driving wealth offshore. In particular, within the range of tax rates spanned by our country sample, tax evasion is rather insensitive to the tax rates.

We also examine impact of the comprehensive anti-money laundering act introduced in Switzerland in 1998. This act seems to have had little effect on the volume of Swiss bank accounts held by countries with weak political governance. This result is consistent with the view that the reputation of the Swiss financial center as a safe haven for illegitimate funds is widespread and hard to change.

Our analysis contributes to the empirical literature on the relation between taxation, tax related information exchange and cross-border bank deposits. Huizinga and Nicodème (2004) use the BIS locational banking statistics to examine bilateral cross-border liabilities and assets of the non-bank sector for 23 OECD countries and financial centers over the period 1983-1999. They find a significant positive relation between home country tax rates and cross-border deposits in the period 1983-1991. However, this relation no longer holds for

1992-1999. In earlier work, Alworth and Andresen (1992) use BIS data for the years 1983, 1986 and 1990 to examine cross-border non-bank deposit flows. Their cross-sectional results suggest that withholding tax and indicators of bank secrecy are determinants of cross-border deposits.

With respect to tax evasion in the Swiss financial center Delaloye et al. (2006) use stock price data to examine the effect of negotiations between Switzerland and the EU concerning tax evasion on the share prices of four major Swiss banks. The authors find that “banking secrecy has a value to Swiss private banks,” the corresponding legislation amounting to about 10% of their value. Closest to our paper, Johannesen (2010) uses BIS data to examine the impact of the 2005 EU savings directive on foreign deposits in Switzerland.³ His analysis suggests that the subsequent introduction of a 15% withholding tax by Switzerland on interest earnings by EU nationals in July 2005 led to a reduced Swiss bank deposits by EU nationals by up to 44% between 2005:Q1 and 2006:Q3.

We contribute in three ways to the above literature: First, we examine the impact of taxation on cross-border deposits for a broader range of origin countries (29 OECD and 66 non-OECD countries). Second, we disentangle the impact of taxation in origin countries on total cross-border deposits from its impact on the specific share of deposits held in offshore financial centers such as Switzerland. Third, we disentangle the “tax effect” of the recent EU savings directive on offshore banking by EU nationals from a “deterrence effect” of the directive by comparing the directive’s effect on those deposits with Swiss banks which were affected by the directive to those which were not.

³ The EU savings directive covers 25 EU and 15 non-EU territories introducing two potential regimes for the exchange of information to prevent tax evasion. The first regime implies an automatic information exchange between national tax authorities on taxable cross-border asset holdings. The second regime involves a withholding tax on selected foreign asset holdings, which is partly transferred to the country of residence of the asset holder. Switzerland implemented the second regime along with Austria, Belgium, Luxembourg and other non-EU territories. See section 4.2 below and Johannesen (2010) for further details.

Our paper also contributes to the empirical literature on capital flight from developing countries and emerging markets. Initiated by studies by Cuddington (1986) and Dooley (1988) this literature examines the macroeconomic, fiscal, and institutional determinants of outward capital flows from developing economies. Examining data for 17 developing countries over the period 1978-1993, Schineler (1997) provides evidence suggesting that macroeconomic uncertainty and expected future taxation seem to fuel capital flight. Collier et al. (2001) provide a cross-sectional analysis of capital flight from 50 developing and emerging countries in 1990. They find that the extent of capital flight varies strongly across regions; from 6% of private wealth in East Asia to 40% of private wealth in Sub-Saharan Africa. Their analysis shows that macroeconomic imbalances, foreign indebtedness and investor risk spur capital flight. We contribute to the literature on capital flight in two ways: First, we examine how taxation and weak political governance (corruption, internal conflict, instable government) affect cross-border assets in a broad sample of developing (and developed) countries. Second, we assess to what extent cross-border assets of countries with weak governance (and high taxation) are particularly held in offshore centers such as Switzerland.

Finally, our paper is related to the empirical literature on the determinants and impact of tax havens and offshore financial centers. Dharmapala and Hines (2009) examine which countries become a tax haven, using cross-sectional data for 180 countries. Their analysis shows that, controlling for aggregate income and legal tradition, countries with better governance institutions are more likely to become a tax haven. Rose and Spiegel (2007) examine the impact of offshore financial centers on their neighboring countries. They use data from the Coordinated Portfolio Investment Survey (CPIS) of the International Monetary Fund to examine cross-border asset positions for 69 source countries and 222 host countries in 2000/2001. They find that tax havens attract more cross-border funds from neighboring

countries. However, they also find that proximity to an offshore centre spurs financial sector development in the source country, i.e. it reduces the intermediation spread, reduces bank concentration and increases the aggregate credit volume. Lane and Milesi-Feretti (2010) estimate the role of small international financial centers (excluding Switzerland) in channeling cross-border investment positions. Using CPIS and BIS data they provide (conservative) estimates suggesting that 8.5 percent of global cross-border assets and liabilities are held in small international financial centers. Zucman (2011) builds on the methodology of Lane and Milesi-Feretti (2001; 2007) to analyze the role of tax havens in generating large discrepancies in globally reported cross-border assets and liabilities. His analysis suggests that cross-border assets held in tax havens can readily account for this “missing wealth of nations.” Moreover, his estimates suggest that one-third of global offshore assets are held in Switzerland.

The remainder of this paper is organized as follows. Section 2 introduces the data and methodology. Sections 3 and 4 present the empirical results and section 5 concludes.

2. Data & Methodology

2.1 Cross-border deposits

Our main data source is the Swiss National Bank (SNB) annual publication on “Banks in Switzerland.”⁴ This publication provides detailed information on the assets, liabilities and off-balance sheet items of the banks domiciled in Switzerland. In particular, it contains a country-by-country breakdown of the origin of the banks’ main balance sheet and off-balance sheet positions.

⁴ The data is publicly available at <http://www.snb.ch/en/i/about/stat>.

From the “Banks in Switzerland” statistics we calculate two annual measures of Swiss banks’ liabilities towards individual countries: *Deposit accounts* is the total volume of savings, sight and term liabilities of Swiss banks towards non-banks of each country at the end of each year. *Fiduciary accounts* is the total volume of fiduciary liabilities of Swiss banks towards each country at the end of each year. Fiduciary accounts are funds which are invested in money markets by the bank on behalf of their clients.⁵

Figure 1 here

Figure 1 displays the volume of *Deposit accounts* and *Fiduciary accounts* by year for our observation period of 1987 – 2007 in current US dollars. In this figure we aggregate the liabilities of Swiss banks towards all foreign countries, excluding other offshore financial centers. The SNB publishes this data separately for the group of *Large banks* (UBS and Credit Suisse) as well as for the group of all *Other banks*. Figure 1a presents the total volume for all Swiss banks, while Figure 1b and Figure 1c present the data for Large banks and Other banks separately. The figure shows that the total volume of foreign deposit and fiduciary accounts rose fourfold from 118 USD billion in 1987 to 484 USD billion in 2007. This increase was largely due to a seven-fold increase in deposit accounts (53 USD billion in 1987 to 347 USD billion in 2007), while the volume of fiduciary accounts only doubled.⁶ Figure 1b shows that the large increase of *Deposit accounts* can be mainly attributed to the two *Large banks*, UBS and Credit Suisse. Figure 1c shows that the foreign liabilities of these banks experienced a much more moderate increase during our observation period. Also, in contrast to the *Large*

⁵ These accounts enable clients to invest in money markets if they don’t have sufficient volumes of assets to do so directly. As the bank is only entrusted with these funds they do not appear on the banks balance sheet.

⁶ The observed increase in volume cannot be attributed to the appreciation of the Swiss Franc (CHF) vis a vis the USD, as only a negligible share of these funds are denominated in CHF.

banks the liabilities of the *Other banks* are dominated by fiduciary accounts rather than deposit accounts.

We normalize our indicators of bank liabilities by Gross Domestic Product (GDP) of each origin country c at time t to yield a measure of the volume of Swiss bank accounts in relation to the economic activity of each country. GDP is measured in current US dollars, as provided by the World Development Indicators (WDI) of the World Bank.⁷ We hereby obtain our first three dependent variables: $Deposits / GDP_{c,t}$ is the volume of deposit accounts in percent of GDP by origin country and year. Likewise $Fiduciary / GDP_{c,t}$ is the volume of fiduciary accounts in percent of GDP by origin country and year. Finally, the variable $Accounts / GDP_{c,t}$ is the volume of deposit and fiduciary accounts in percent of GDP by origin country and year.

Figure 2 displays the liabilities of Swiss banks towards each of the OECD countries averaged across the period 2000-2007. The figure shows a large disparity in the volume of Swiss bank accounts across the subsample. For Greece the volume of deposit and fiduciary accounts with Swiss banks amounts to 2.5% of GDP, while for Finland or Denmark they amount to less than .2% of GDP. Interestingly, the USA and Germany which were recently engaged in strong political debates with Switzerland over offshore banking activities, display relatively moderate volumes of accounts with Swiss banks (.8% and .7% of GDP respectively) compared to other OECD countries.

Figure 2 here

⁷ Normalization by GDP eliminates potentially spurious effects of price levels on our analysis.

From the BIS locational banking statistics we obtain the total on deposit and fiduciary liabilities of all BIS reporting banks towards each country in each year.⁸ We normalize this indicator by the GDP (in %) of each country c in year t to obtain $BIS\ deposits / GDP_{c,t}$, as a measure of each country's total volume of offshore deposits in each year. We also normalize the volume of deposit and fiduciary accounts each country has with Swiss banks by their total cross-border deposits with BIS reporting banks. We employ the resulting variable $Accounts / BIS_{c,t}$ as a measure of the share (in %) of a country's total cross-border deposits which are held with Swiss banks. Using this measure we will be able to assess whether countries with high taxation or weak political governance have a particularly large share of their cross-border deposits in Switzerland.

Figure 3 displays the variable $Accounts / BIS_{c,t}$ for each of the OECD countries, again averaged across the period 2000-2007. The figure shows a large disparity in the share of offshore deposits which countries hold with Swiss banks. For Turkey, the Czech Republic and Italy, we see that more than 35% of their total cross-border deposits are held with Swiss banks, while for the Netherlands this ratio is only 3.3%. Again it is remarkable that the share of US or German foreign deposits which are held with Swiss banks is moderate compared to other OECD countries (9% each).

Figure 3 here

While our data do provide a rich country-by country breakdown of Swiss banks' deposit and fiduciary liabilities over a long period of time, it is subject to four major limitations:

⁸ The BIS locational banking statistics are publically available for the period 1995 – present at quarterly intervals. We use the 4th quarter observations for each year as our end of year measure of total cross-border deposits of an origin country.

The first limitation of our data is that bank liabilities are attributed to the country of immediate residence of the holder. This implies that we do not observe the actual origin of a liability if the corresponding client invests indirectly via a third country, for example an offshore center. Indeed, aggregate SNB data suggests that 36% of foreign deposit accounts and 47% of fiduciary accounts “originate” from offshore centers. We tackle this limitation by excluding liabilities from other offshore centers from our analysis. Individuals engaging in offshore banking by motives of tax evasion should be more inclined to build opaque deposit structures via third countries in order to complicate the tracking of their identity. Therefore, whenever we still find positive correlations after excluding main offshore centers, it is likely that the true relationship between our variables is even stronger.

The second limitation of our data is that our measure of *Deposit accounts* include accounts which are held at branches of Swiss banks abroad, e.g. the deposits of Americans with a branch of UBS in the USA. Our aim is to examine the volume of offshore accounts held by foreigners in Switzerland. However, by this latter data limitation we cannot distinguish offshore deposits of foreigners in Switzerland from “onshore” deposits with branches of Swiss banks abroad. We deal with this limitation by conducting separate analysis for the *Large Swiss banks* (UBS and Credit Suisse) and *Other banks*. While the former have a global network of branches and thus a significant share of “onshore” deposits, the latter have few foreign branches and attract almost exclusively offshore funds. As shown in Figure 1 the large increase of foreign deposit accounts with Swiss banks during our observation period can be mainly attributed to the two large banks. This development may well reflect an increase in onshore banking through the global branch network of these banks, rather than an increase in their offshore banking. This observation underlines the importance of conducting separate analyses for the Other banks which conduct their business primarily from Switzerland.

Our third data limitation is that our measure of *Deposit accounts* does not disentangle deposits of private persons from those of non-financial firms. In this study we are interested in how offshore deposits are driven by taxation and weak political institutions in the home country. To the extent that our data also includes deposits of foreign non-financial firms it may be affected by changes in trade patterns and economic conditions for these firms.⁹ We deal with this limitation in two ways. First, as we discuss in detail below, we include controls for the economic ties between Switzerland and the home country in our multivariate analysis. Second, we provide separate analyses for *Fiduciary accounts* which are hardly contaminated by deposits of non-financial firms. Given that non-financial firms typically have direct accesses to money markets, fiduciary accounts are predominantly used by private persons.

Fourth, our dataset does not cover securities held in custody accounts. Aggregate data suggests that at the end of 2007, foreign private individuals held securities valued at 1'108 billion CHF in custody accounts with Swiss banks, while balance sheet deposits by foreign clients amounted to 750 billion CHF and fiduciary accounts amounted to 400 billion CHF. Unfortunately, the SNB data does not include a country-by-country breakdown of the foreign holders of custody accounts. However, given that foreign clients who hold custody accounts typically maintain a deposit account for liquidity management our variable *Deposit accounts* provides an indirect measure of the origin of custody accounts as well.

Note that each of the above mentioned limitations of our data also apply to the BIS locational statistics. This makes our results directly comparable to those of the existing literature on taxation and cross-border deposits that relies on exactly these BIS data (see e.g. Huizinga and Nicodème, 2004). It allows us, to disentangle the effects of taxation and

⁹ See Fornari and Levy (2000) for the impact of trade and macroeconomic conditions on cross-border deposits.

political governance on total cross-border deposits from their specific effect on deposits in Switzerland in a consistent way by jointly using both datasets.

2.2 Taxation and political governance in the origin countries

Our measure of taxation is the top marginal income tax rate of each country. We recognize the general difficulty in comparing taxation across countries given the different tax systems worldwide with their variety of changing tax brackets, tax breaks and other fiscal peculiarities. For the purpose of our analysis, however, the top marginal income tax rate is a natural and appropriate choice since the top marginal tax rates on income affect only the wealthiest individuals of a country, i.e. a group of individuals which is likely to be most inclined to engage on offshore banking.

For data on income taxation we draw on the Economic Freedom of the World (EFW) database provided by the Fraser Institute. This database, which covers 141 countries, includes a measure of the top marginal income tax rate as one of its subcomponents of the EFW index. We call the top marginal income tax in country c at time t , *Tax rate* c,t and measure it in percentage terms.¹⁰ As discussed in section 3.1 we check the robustness of our results using a measure of capital income taxation, i.e. the taxation of personal income in the form of dividends. For this indicator, which is only available for OECD countries, we revert to the OECD Tax Database.¹¹

Our indicator of taxation displays strong cross-sectional and time variation. Considering the OECD countries, for example, it ranged in 2000 from 32% in the Czech Republic to 63% in Belgium. Moreover, in all OECD countries tax rates declined during our observation

¹⁰ The data is publicly available at <http://www.freetheworld.com>. Between the years 1980 and 2000, data are recorded on the basis of five-year intervals; since 2000 they are available on a yearly basis.

¹¹ Available at http://www.oecd.org/document/60/0,3343,en_2649_34533_1942460_1_1_1_37427,00.html

period. The average tax rate in these countries fell from 67% to 44% between 1987 and 2005, with Italy displaying the steepest decline in income taxation (-36%) over this period. Beyond the OECD countries we find that income taxation also varies substantially, ranging in 2000 from 0% (Kuwait, Oman, United Arab Emirates, Uruguay and Paraguay) to 65% (Cameroon).

Political governance in origin countries is our second main variable of interest. Following the literature on capital flight (Collier, 2001) we expect that countries which display higher levels of corruption, inefficient bureaucracies, instable governments, internal conflict etc. to have larger volumes of cross-border deposits. Our measure of political governance is taken from the International Country Risk Guide (ICRG). The ICRG publishes an index of *Political risk* for a set of 128 countries going back to 1984. This index is made up of 12 sub-indices measuring Law and Order, Corruption, Bureaucratic quality, Democratic accountability, Investor protection, Government stability, Socioeconomic stability, Ethnic tensions, Internal and external conflict, as well as the role of the military or religion in politics. This composite indicator of political risk thus captures a wide range of institutional and socioeconomic risks which may encourage capital flight of legitimate funds but in particular also foster offshore depositing of illegitimate funds.

We normalize the measure so that it ranges between 0 (low political risk) and 100 (high political risk). Our data display strong variation in the level of political risk across countries. In 2005, for example, our indicator varies from 6.5 in Finland to 75.2 in Somalia. There is also considerable variation in political risk within countries during our observation period. For example between 1987 and 2007, this indicator fell by over 30 points in eight countries, including El-Salvador, the United Arab Emirates, or Cyprus, while it increased by over 10 points in Somalia, North Korea and the Ivory Coast.

Figure 4 here

Figure 4 plots our variables *Tax rate* and *Political risk* for 29 OECD countries against three indicators of cross-border deposits measuring the volume of deposit and fiduciary accounts with Swiss banks, (*Accounts / GDP*), the total volume of cross-border deposits (*BIS deposits / GDP*), and the share of total cross-border deposits held at Swiss banks (*Accounts / BIS*). The plots are based on 2000-2007 averages for each variable, corresponding to the cross-sectional multivariate analysis which we will present below. The three scatter plots in the upper panel of the figure display a striking finding: Income taxation in OECD countries (*Tax rate*) is not at all positively related to the volume of deposits in Swiss bank accounts (*Accounts / GDP*), or the Swiss share of a country's cross-border deposits (*Accounts / BIS*). Also, in line with the findings of Huizinga and Nicodème (2004) Figure 4 suggests that income taxation in OECD countries is not related to the total cross-border deposits of these countries (*BIS deposits / GDP*).

The lower panel of Figure 4 suggests that OECD countries with weaker political governance (e.g. Turkey) do have a higher volume of deposit accounts at Swiss banks (*Accounts /GDP*). Moreover, this relation does seem to be specific to the Swiss financial center: *Political risk* seems, if anything, negatively correlated with total cross-border deposits (*BIS deposits /GDP*), while it is strongly positively correlated to the share of cross-border deposits which are held with Swiss banks (*Accounts/BIS*).

Figure 5 here

Figure 5 replicates the scatter plots presented in Figure 4 for a broader sample of OECD and non-OECD countries. Two patterns in the data stand out: First, the lower panel of the figure confirms our finding from Figure 4 that countries with high *Political risk* have a lower

volume of total cross-border deposits, but a larger share of these deposits in Switzerland. Second, in the upper panel of the figure we find a negative correlation between taxation and the volume of deposits in Swiss bank accounts. The figure suggests that this unexpected pattern is at least partly driven by some oil-exporting countries which have low taxation and substantial cross-border wealth (Kuwait, United Arab Emirates). In our panel analysis below we will use country fixed effects to control for country characteristics such as commodity exports, which possibly drive part of the raw correlations observed in Figure 5.

2.3 Methodology

To assess the link between taxation and political governance on the one side and the volume of deposits held with Swiss banks on the other; we conduct both cross-sectional and panel estimations.

For our cross-sectional analysis we average our data per country over the period 2000-2007 and estimate the following empirical model:

$$\ln(\text{Account}_c) = \alpha + \beta_1 \text{Tax rate}_c + \beta_2 \text{Political risk}_c + \gamma \text{Controls}_{c,t} + \varepsilon \quad [1]$$

Account_c represents the five dependent variables which we examine in our analysis. We employ three measures of the volume of deposits held with Swiss banks: *Fiduciary accounts / GDP*, *Deposit accounts / GDP* as well as the sum of the two (*Accounts / GDP*). We further employ the variables *BIS deposits / GDP* and *Accounts / BIS* to disentangle the impact on total cross-border deposits from that on the Swiss share of cross-border deposits per country.

Our decision to take the natural logarithm of our dependent variable requires a word of explanation. First, by taking logs, the observed distribution of the data becomes less skewed so that the according regressions give less weight to outliers. Moreover, expressing the

account variable in logs serves well our goal to disentangle the impact on Swiss bank accounts from those on total cross-border deposits. To see this it is useful to observe that the GDP-normalized deposit and fiduciary accounts at Swiss banks ($Accounts/GDP$) is simply the product of, first, deposits at Swiss banks as a share of all cross-border deposits ($Accounts/BIS$) and, second, GDP-normalized total cross-border deposits ($BIS\ accounts / GDP$). Thus, when taking natural logarithm of this product, the components decompose into two additive terms: $\ln(Accounts/GDP) = \ln(Accounts/BIS) + \ln(BIS\ deposits / GDP)$. This linear decomposition perfectly is in accordance with our linear model specified in [1].

Table 1 here

For our two main explanatory variables *Tax rate* and *Political risk* we employ the values at the beginning of the period under consideration, i.e. the values for the year 2000.

Controls is a vector of three variables, which control for differences in income-levels across countries as well as their economic ties with Switzerland. The definition and sources of all variables, including these controls are displayed in Table 1. We include per capita GDP of the origin country, measured in logs of current US dollars ($GDP\ per\ capita$). This control variable proxies, among other things, for financial development in origin countries, while it also accounts for unobserved institutional quality. Data on income per capita are taken from the World Development Indicators (WDI). As discussed above, our data do not exclude non-financial firms from the sample of depositors at Swiss banks, so that we risk mixing up the effects of international trade with those of wealth management motives to deposit money at Swiss banks. We therefore include bilateral trade with Switzerland, defined as yearly exports plus imports on a bilateral basis. We normalize by GDP, measured in current US dollars and take natural logs of this variable to obtain our control variable with *Trade with CH*. Our

source for the trade data is the Direction of Trade Statistics of the IMF; GDP is again taken from the WDI. Finally, we control for geographical distance to Switzerland (*Distance*) with data provided by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) and measured in terms of log kilometres between the Swiss capital Bern and the capital of each origin country. Tables 2 and 3 report summary statistics and pairwise correlations for all variables employed in our cross-sectional analysis.

Table 2 here

Table 3 here

In addition to our cross-sectional analysis, we exploit the time dimension of our dataset to conduct a panel analysis. This allows us to control for unobserved (time invariant) country-specific characteristics, which may be correlated with cross-border deposits. Analogous to our cross-sectional exercise we estimate the following panel model.

$$\ln(\text{Account}_{c,t}) = \alpha_c + \alpha_t + \beta_1 \text{Tax rate}_{c,t} + \beta_2 \text{Political risk}_{c,t} + \gamma \text{Controls}_{c,t} + \varepsilon_c \quad [2]$$

For our panel analysis we split our data into 5 periods: 1987-1989, 1990-1994, 1995-1999, 2000-2004 and 2005-2007. We take averages of our dependent and control variables within each of these periods, while we again measure our main explanatory variables (*Tax rate*, *Tax rate*, *Political risk*) at the beginning of each of these periods (1987, 1990, 1995, 2000, 2005). Table 4 presents summary statistics for all variables employed in our panel analysis by period.

Table 4 here

We use multi-year periods rather than annual data for two reasons: First, one of our main explanatory variables, *Tax rate*, is only available at a five-year frequency. Second, by extending the time-frame to five years rather than looking at one-year windows, we allow economic conditions and the resulting incentives of individual depositors to materialize with some time-lag. This method is commonly used for example in the empirical studies of the relation between finance and growth (e.g. King and Levine, 1993).

Besides country fixed effects α_c we include period fixed effects α_t to control for common trends in cross-border deposits with Swiss banks. Such trends are likely given institutional changes in Switzerland regarding foreign deposits during our observation period of 1987-2007. For example, as discussed in section 3.3 in detail, Switzerland introduced comprehensive anti-money laundering statutes in 1998. Our period fixed effects account for the common impact of such institutional changes on all origin countries. At the same time they account for changes in the strategies of Swiss banks over time to attract and serve foreign clients, e.g. the increased onshore presence of Credit Suisse and UBS from the end of the 1990's onwards.

3. The impact of taxation and political governance in origin countries

In presenting our results we focus on the OECD sample in section 3.1 in order to make our results comparable with previous research (e.g. Huizinga and Nicodème, 2004). In section 3.2 we turn to the full sample of OECD and Non-OECD countries.

3.1 Estimates for the OECD Sample

Table 5 reports our cross-sectional results for the sample of OECD countries. In columns 1 to 3, the dependent variable is *Accounts/GDP* and thus comprises the average volume of

deposit and fiduciary accounts for each country at Swiss banks over the 2000-2007 period. In columns (4-5) we conduct subsample analyses. First we look at the accounts with *Other banks* only (column 4), i.e. excluding the large banks which have global branch networks. We then look at the volume of *Fiduciary accounts* only, which are not contaminated by the deposits of non-financial firms. In columns (6-7) we decompose the effect of taxation and political governance on Swiss bank accounts into effects on total cross-border deposits (*BIS deposits / GDP*) and the Swiss share of these deposits (*Accounts / BIS*).

Table 5 here

The results in Table 5 show that there is no relation between income taxation in OECD countries and the volume of Swiss bank accounts. In columns (1-5) we actually yield a negative estimated coefficient on *Tax rate OECD*. However, the magnitude of the coefficients is small and they are far from statistical significance at conventional levels.

We also find no clear evidence that political governance in OECD countries affects the volume of deposits at Swiss banks. *Political risk* is positive and significant at the 10% level in columns (2) and (3). However, this result is not confirmed in our subsample analyses for *Other banks* and *Fiduciary Accounts* in columns (4-5).

Why do we find no relation between taxation in OECD countries and Swiss bank accounts? Is this result driven by the fact that taxation does not affect cross-border deposits *per se*, as suggested by Huizinga and Nicodème (2004)? Or is it driven by a Swiss-specific effect, i.e. the Swiss share of cross-border deposits is unrelated or even negatively related to taxation in origin countries. To address these questions, we separately assess the correlation between taxation and total cross-border deposits as well as the one between taxation and the Swiss share of cross-border deposits. The estimated coefficient in column (6) shows that total

cross-border deposits of OECD countries are not significantly correlated with higher taxation in these countries. This finding is in line with those reported by Huizinga and Nicodème (2004), generalizing our earlier finding from deposits at Swiss banks to cross-border deposits in general. Moreover, the estimates in column (7) show that the Swiss share of cross-border deposits for OECD countries is also unrelated to taxation in the origin country.

The weak cross-sectional estimates presented in Table 5 are possibly caused by unobserved country characteristics (e.g. provision of infrastructure and education) which may be positively related to the level of taxation in the origin country and negatively related to the incentives of residents to deposit cross-border deposits. To establish a causal link between *Tax rate* and deposits at Swiss banks, we therefore turn to our panel analysis. As argued in Section 2, to the extent that changes in top marginal tax rates are not driven by anticipated changes in the amount of cross-border deposits, our panel analysis allows us to show that changes in top marginal tax rates cause changes in cross-border deposits.

Table 6 here

Table 6 reports the findings of our panel analysis for the OECD countries. Columns 1 - 5 rely on the same specifications as the corresponding columns of Table 5. Since we include country-fixed effects, the control variable *Distance* drops from the regressions. The results presented in Table 6 confirm our cross-sectional results. The insignificant coefficients for *Tax Rate* in all specifications suggest that the substantial reduction in income taxation in OECD countries had no impact at all on the (GDP normalized) volume of Swiss bank accounts from these countries. In contrast to our cross-sectional estimates we do yield positive estimates for *Tax Rate* in columns (1) and (3), but these are small in magnitude and not statistically significant. Our panel estimates for *Political risk* further confirm that there is no relation

between governance standards in OECD countries and the volume of Swiss accounts held by these countries.

Overall, the results in Table 5 and 6 suggest that within the OECD sample higher taxation in origin countries is neither associated with a larger volume of Swiss bank accounts, nor is it associated with a larger share of cross-border deposits held in Switzerland. Could this (non-) result may be driven by the fact that our indicator of taxation is imprecise? It could well be that the top marginal income tax rate does not fully capture the incentives to evade taxes implied by the combination of wage income, capital income and wealth taxes in a country. While we do not have access to comparable cross-country data on the taxation of wealth per se, the OECD Tax Database does provide an indicator of the taxation of capital income, i.e. the personal income tax rate on dividend income. As a robustness check we replicate Table 5 replacing our variable *Tax rate* with this indicator of capital income taxation. The results of these robustness checks confirm the findings presented above: capital income taxation in origin countries is not significantly correlated with the volume of Swiss bank accounts or the share of cross-border deposits held in Switzerland.

3.2 Estimates for the sample of OECD and non- OECD countries

In Tables 7 and 8 we repeat our cross-sectional and panel analysis for the full sample of OECD and non-OECD countries. The specifications reported in these tables correspond to those of Tables 5 and 6.

Our cross-sectional analysis confirms the finding from the sample of OECD countries that there is no positive relation between taxation and Swiss bank accounts. Indeed, in columns (1, 3, 4, 5) of Table 7 the estimated coefficients on *Tax rate* are actually negative and significant, suggesting that high taxation countries have lower volumes of Swiss bank accounts. As pointed out when discussing Figure 5, however, this result seems to be driven at

least partly by commodity exporting countries which have low taxes and high cross-border assets. The panel estimates reported in Table 8 suggest indeed that there is no causal relation between taxation in origin countries and Swiss bank accounts in our full sample of OECD and non-OECD countries. In line with our panel estimates for the OECD sample, the estimated coefficients for *Tax rate* in this table are insignificant in all specifications.

The case is different for political risk. In contrast to our estimates for the OECD sample, our cross-sectional and panel estimates for the full sample of countries suggest that countries with weak political governance do have more deposits with Swiss banks (normalized by GDP). The coefficient on *Political risk* is positive and significant in columns (2-5) of both Table 7 and Table 8. The estimated impact of political risk is also sizeable in economic terms: Compare for example a change in this indicator in our cross-sectional data from the lowest political risk (4.8; Netherlands) to the highest risk (67.9; Congo). According to our point estimate in column (3) of Table 7, such a change is associated with an increase in the $\ln(\text{Accounts}/\text{GDP})$ by 2.03 or roughly one third of the range of the dependent variable.¹² Alternatively, consider the effect of the mean reduction in *Political risk* in our panel data over time (41 to 30, see Table 4). According to our estimates in column (3) of Table 8 such a change is associated with a decrease in $\ln(\text{Accounts}/\text{GDP})$ by .12, implying a 12 percentage point decrease in *Accounts/GDP*.

Table 7 here

In columns (6-7) of Table 7 we examine whether the relation between weak political governance and Swiss bank accounts is driven by a general impact of political risk on cross-border deposits or by a specific impact on the Swiss share of these deposits. Our results

¹² With the numbers from Table 2, compute $0.0322 \cdot (67.9 - 4.8) / (\ln(9.412) - \ln(0.012)) \approx 0.31$.

suggest that the relation is clearly driven by a specific Swiss effect. Column (6) of Table 7 shows that total cross-border deposits are not significantly related to *Political risk* (the estimate is negative but insignificant). By contrast, the column (7) estimates shows that political risk of a country is strongly and significantly related to the share of cross-border deposits the country has allocated to Swiss banks.

Table 8 here

In sum, our Table 7 and 8 estimates suggest that, considering a broad sample of OECD and non-OECD countries, there is no causal effect of income taxation on deposits at Swiss banks. Quite contrary, weak political governance in an origin country seems to play crucial role for depositing funds with Swiss banks in particular.

4. The impact of policy changes in Switzerland

Our analysis so far has focused on how taxation and political governance in origin countries affect the volume of Swiss bank accounts. In that analysis we accounted for changes in relevant policy conditions in Switzerland by including time fixed effects in our panel estimates. In this section we look closer at the impact of two major policy changes, which occurred during our observation period and were targeted at reducing money laundering and tax evasion through the Swiss financial center: the 1998 Anti-Money Laundering Act and the implementation of the EU Savings directive in 2005.

4.1 The 1998 Anti-Money Laundering Act

In January 1998, the Federal Act on the Prevention of Money Laundering in the Financial Sector, henceforth called the 1998 Anti-Money Laundering (AML) Act (henceforth called the 1998 AML act or 1998 act) came into force in Switzerland. The 1998 act strengthened previous legislation introduced in 1990 to combat money laundering, with two new components of the new act standing out:¹³ First, the act harmonized the standards set for banks and non-bank wealth managers regarding the prevention of money laundering.¹⁴ Second, the act obliged banks and non-bank wealth managers to actively report suspicious transactions and to block the funds from these transactions. In particular this second feature of the 1998 act was intended to actively combat the inflow of funds to the Swiss financial center from illegitimate sources.

¹³ For the political process prior to the 1998 act and the details of the act itself see Taisch (1992), Sansonetti (1998) and De Boyrie, et al. (2005).

¹⁴ The law specifies the kind of transactions that should prompt banks and other financial institutions (fund managers, insurance firms, foreign exchange bureau, lawyers) to pay special attention and perform supplement checks. Further, the law provides to banks and other financial institutions a non-exhaustive list of thirty pointers that may arouse suspicious that money laundering may be involved.

To assess whether the 1998 AML act had the intended effect, we conduct a difference-in-difference test: We compare the volume of Swiss bank accounts for each country before and after the introduction of the 1998 act. Hereby, we examine whether the change in volume differed for countries with high *Political risk* versus those with low political risk. Our hypothesis is that if the 1998 AML act did reduce money-laundering through the Swiss financial system, we should observe that countries with high political risk saw a stronger decrease in their volume of Swiss bank accounts after its introduction, compared to countries with low political risk.

Table 9 here

Table 9 reports the results of our difference-in-difference analysis. As dependant variables we employ *Accounts / GDP* and *Accounts / BIS*. We therefore not only examine the impact of the 1998 AML act on the volume of deposit and fiduciary accounts held in Switzerland, but also on the Swiss share of each country's total cross-border deposits. In columns (1-4) we conduct our analysis comparing our dependant variables immediately before (December 1997) and after (December 1998) the introduction of the act. In columns (5-8) we extend our period of analysis, comparing a three-year period prior to the act (1995-1997 averages) to a three year period after its introduction (1998-2000 averages). In all regressions we include the dummy variable *AML* which is 1 for the period after the introduction of the act. More importantly, we interact *AML* with the variable *Political risk* which captures the political risk of each country in 1995. All estimates are conducted using our full sample of OECD and non-OECD countries, as our previous analysis suggests that political risk is a major determinant of Swiss bank accounts in this full sample.

We find no evidence that the 1998 AML act reduced money laundering through the Swiss financial center. The coefficient on the interaction term of our interest *AML * Political risk* is negative in 3 of the 4 models where it enters as an explanatory variable (columns 2, 4, 6, 8). However, it is not significant in any of these specifications. The negative and significant coefficient of *AML* in column (3) suggests that in the period immediately after the introduction of the act the share of total cross-border accounts of origin countries held in Switzerland fell. However, this finding is not confirmed when we extend the period of analysis (column 7), nor does it go hand in hand with a drop in the volume of accounts held at Swiss banks (Columns 1, 5).

In sum, our analysis suggests that there was no significant impact of the Switzerland's 1998 AML act on foreign deposits with Swiss banks. Our finding (or the lack thereof) is consistent with earlier studies investigating the behavior of banks and depositors in reaction to money laundering legislation. De Boyrie et al. (2005) argue that the enactment of the 1998 legislation induced depositors to use alternative methods to launder money so that, in particular, the foreign funds stayed within the Swiss banking system.¹⁵ In an earlier study, English and Shahin (1994) focus on banks' reaction to anti-money laundering legislation, showing that Swiss banks raised deposit rates in order to prevent outflows of deposits. Overall, such reactions prevent or mitigate the outflow of deposits from Swiss banks so that it is less surprising to obtain insignificant estimates when analyzing the reaction of equilibrium deposits in response to anti-money laundering legislation.

¹⁵ The authors report a significant increase in the movement of money through false invoicing in international trade transactions.

4.2 The 2005 implementation of the EU savings directive

In 2003 the European Union adopted the “Directive on taxation of savings income in the form of interest payments” with the aim of reducing tax evasion by EU residents.¹⁶ Under this directive two potential regimes for cross-border exchange of information were foreseen to prevent tax evasion. The first regime involved an automatic information exchange between national tax authorities on taxable cross-border asset holdings. The second regime involved a withholding tax on interest income, which is to be partly transferred to the country of residence of the asset holder. The directive initially covered the 25 EU member countries at that time as well as selected 15 non-EU jurisdictions.

Switzerland was one of the 15 non-EU jurisdictions with which the EU conducted negotiations under this EU savings directive. During these negotiations Switzerland agreed to implement the withholding tax regime. The agreement requires Swiss banks to levy a withholding tax on the interest income of EU residents at 15% in 2005, increasing to 20% in 2008 and 35% in 2011. The Swiss Federal administration is responsible for collecting this withholding tax and transferring 75% of the proceeds to the respective EU countries.

Interestingly, not all deposits of EU national with Swiss banks were subject to the 15% withholding tax introduced in 2005. The reason is that the interest income on all assets issued by Swiss debtors, including deposits on the balance sheets of Swiss banks are already been subject to a 35% withholding tax by Swiss authorities. This Swiss withholding tax applies equally to Swiss residents and foreign residents, and thus also to EU nationals. Due to the Swiss withholding tax, interest income on savings deposits by EU nationals with Swiss banks were exempted from the ‘new’ 15% withholding tax introduced under the EU Savings

¹⁶ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:157:0038:0048:en:PDF>

directive. By contrast, the interest income on fiduciary accounts held with Swiss banks were not subject to the Swiss withholding tax and were thus subject to the ‘new’ withholding tax.

A recent study by Johannesen (2010) uses BIS data to examine the impact of the EU savings directive on foreign deposits in Switzerland. His findings suggest that the introduction of the 15% withholding tax in 2005 reduced Swiss bank deposits by EU nationals by up to 44% between 2005:Q1 and 2006:Q3 in comparison to non EU nationals. However, Johannesen (2010) conducts his analysis using the total volume of savings and fiduciary accounts held with Swiss banks, and thus groups deposits which were subject to the tax effect of the EU savings directive (fiduciary accounts) with those which were not (deposit accounts). It is unclear therefore, whether the impact of the EU savings directive on Swiss bank accounts identified in his study are actually driven by direct tax considerations, or alternatively by a general “deterrence effect” of the EU savings directive: EU nationals may have become aware that the EU intends to take strong measures to prevent tax evasion and consequently moved to reduce or reallocate their Swiss bank accounts.

Considering the volume of fiduciary and deposit accounts in 2004 and 2005 suggests that the impact of the EU savings directive on Swiss bank accounts of EU nationals was driven by a “tax effect” rather than a “deterrence effect.” Between 2004 and 2005 the volume of fiduciary accounts by residents of 15 EU members countries fell from .45% of GDP to .28% of GDP, while the corresponding ratio for the residents of other OECD countries increased from .81% to .94%. The volume of deposit accounts, by contrast, shows a similar development for EU15 residents (.69% of GDP in 2004 to .62% of GDP in 2005) as they do for the other OECD countries (.80 % of GDP in 2004 to .68% of GDP in 2005).

We disentangle the “tax effect” of the EU savings directive from its “deterrence effect” by performing a difference-in-difference analysis separately for tax affected and non-tax affected deposits: We compare the volume of *Accounts/ GDP*, *Fiduciary /GDP*, and

Deposit /GDP by country before and after July 2005. Hereby, we examine whether the change in volume differed for EU nationals to non-EU nationals. We limit our analysis to the subsample of OECD countries as our previous findings suggest that taxation is a key determinant of the volume of Swiss bank accounts among these countries.

Table 10 reports the findings of our difference in difference analysis. In columns (1-3) we conduct our analysis comparing our dependant variables immediately before (December 2004) and after (December 2005) the introduction of the 15% withholding tax on fiduciary accounts. In columns (4-6) we extend our period of analysis, comparing a three-year period prior to the introduction (2002-2004 averages) to a three year period after its introduction (2005-2007 averages). In all regressions we include the dummy variable *Savings directive* which is 1 for the period after 1st July 2005. More importantly we interact *Savings directive* with the variable *EU15* which is 1 for the EU15 countries, and 0 for the other OECD countries.¹⁷

Table 10 here

Our results confirm that the impact of the EU savings directive on Swiss bank accounts of EU nationals was largely driven by a “tax effect”, rather than a “deterrence effect.” The negative and significant interaction term *Savings directive*EU15* on *Accounts / GDP* confirms the finding in Johannesen (2010) that the total volume of savings and fiduciary accounts of EU15 nationals with Swiss banks declined significantly compared to other OECD nationals after the implementation of the savings directive. This result holds both when considering the immediate phase before and after July 2005 (column 1) as well as when

¹⁷ In focusing on the EU15 rather than all EU member countries we allocate the Czech Republic, Hungary, Poland and Slovakia to our control rather than the treatment group. In doing so we follow the approach of Johannesson (2010).

considering a three-year phase prior to and after the implementation (column 4). Strikingly, the interaction term *Savings directive*EU15* is highly significant and larger in magnitude when we consider the tax-affected fiduciary accounts only (columns 3, 6). By contrast, when we consider deposit accounts only the interaction term is smaller and of borderline significance (column 5) or insignificant (column 2). Our results thus show that the EU savings directive implemented in 2005 did lead to a significant reallocation of Swiss bank accounts *in order to evade the newly introduced withholding tax*.

The finding that EU residents holding fiduciary accounts at Swiss banks substituted away from these accounts once they were taxed appears to be in contrast with our earlier result that taxation is not a key determinant of Swiss bank accounts. There are two possible explanations to reconcile these results:

First, while taxation in origin countries may not be the primary motive for depositing funds with Swiss banks it may well be the case that, once clients have their funds offshore, they choose assets which minimize withholding taxes. For example, a German resident may deposit funds in Switzerland in order to conceal them from relatives, rather than from tax authorities. Once the funds are deposited in Switzerland, such a client may, however, consider the tax consequences of each asset type when deciding upon how exactly to invest his funds. Indeed, while EU residents did reduce their volume of *Fiduciary accounts* after 2005 this observation does not imply that they reduced their overall volume of funds held with Swiss banks. Instead, the drop in *Fiduciary accounts* may have occurred due to a reallocation of funds to non-fixed income assets which are not (yet) subject to the EU savings directive, e.g. equity or structured products held in custody accounts. Unfortunately, our data does not allow us to analyze flows from fiduciary accounts to custody accounts.

Second, it is possible that due to threshold effects our analysis in section 3 may not pick up the key role of tax evasion in driving foreign wealth to Swiss bank accounts. Thus, the

relevant group of individuals may decide to evade taxes at low tax rates already so that related deposits are insensitive to the tax rates within the range of tax rates spanned by our country sample. Indeed, the impact of the 15% withholding tax on fiduciary accounts of EU residents in 2005 suggests that there is a number of foreign depositors with Swiss banks who have a very low threshold (i.e. less than 15 %) above which they try to evade taxes. Our analysis in section 3.1, however, examines the sensitivity of the volume of Swiss bank accounts to changes in tax rates in the range of 32%-63%. If the sensitivity of offshore deposits to origin country tax rates is particularly strong at low tax rates, then this would not be captured by our analysis in section 3.1 while it would show up in the analysis based on the *Savings directive*.

5. Conclusions

In this paper we examine how income taxation and political governance in 99 OECD and non-OECD countries affect their volume of cross-border deposits with Swiss banks. We find that higher taxation in an origin country is not associated with a larger volume of deposits with Swiss banks, nor with a larger share of cross-border deposits held in Switzerland. By contrast, in our full sample of OECD and non-OECD countries we do find that weak political governance, e.g. corruption, internal conflict, instable government, is associated with a higher volume of deposits with Swiss banks. Moreover, weak political governance makes residents more inclined to choose Swiss banks to deposit their cross-border deposits.

Our analysis further documents the impact of recent policy measures to combat money laundering and tax evasion in the Swiss financial center. We find that the introduction of a 15% withholding tax on the interest of fiduciary accounts earned by EU nationals led to a significant reduction in such accounts with Swiss banks from the affected countries. This result is not inconsistent with the missing correlation between deposits and taxation in origin countries reported above. Together, both findings suggest that, while taxation may not be the

main motive for depositing funds with Swiss banks, foreign residents do seem to choose the type of assets they hold with Swiss banks to minimize tax on capital income. Alternatively, our findings may imply that, due to threshold effects our analysis of taxation in origin countries does not pick up the role of tax evasion in driving wealth offshore. In either case, our results indicate that empirical strategies that simply rely on top tax rates miss some, potentially crucial, effects of taxation on offshore deposits.

Finally we find that the comprehensive anti-money laundering act introduced in 1998 seems to have had no effect on the volume of Swiss bank accounts held by countries with weak institutions. This finding is consistent with another of our earlier results: The Swiss financial center does seem to be a preferred haven for funds from such countries and this status has not changed substantially in recent years.

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Figure 1. Deposit and Fiduciary accounts, Volume 1987-2007

The figure shows the volume of foreign *Deposit accounts* and *Fiduciary accounts* at Swiss banks over the period 1987 - 2007. The volumes are reported for *All banks* together, as well as separately for the two *Large banks* (Credit Suisse and UBS) as well as for all *Other banks*. Volumes are reported in billion USD.

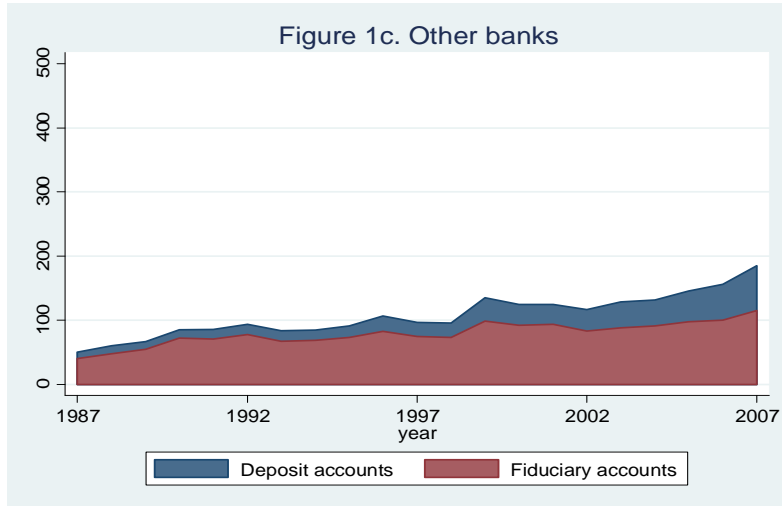
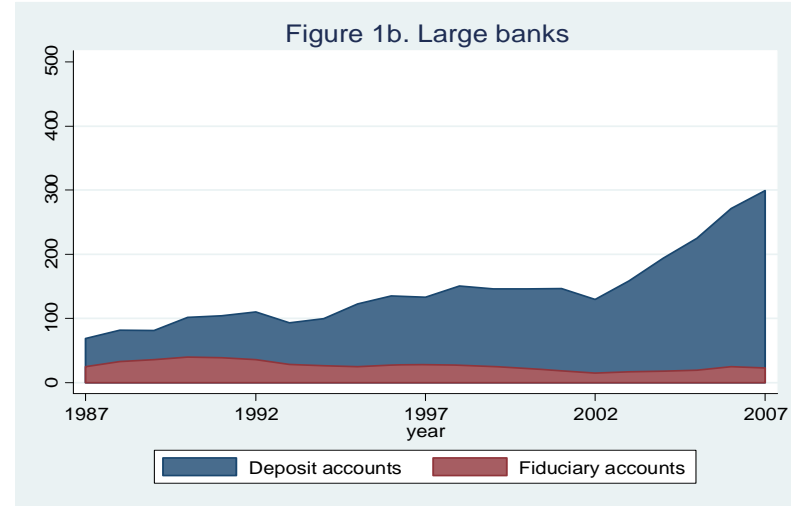
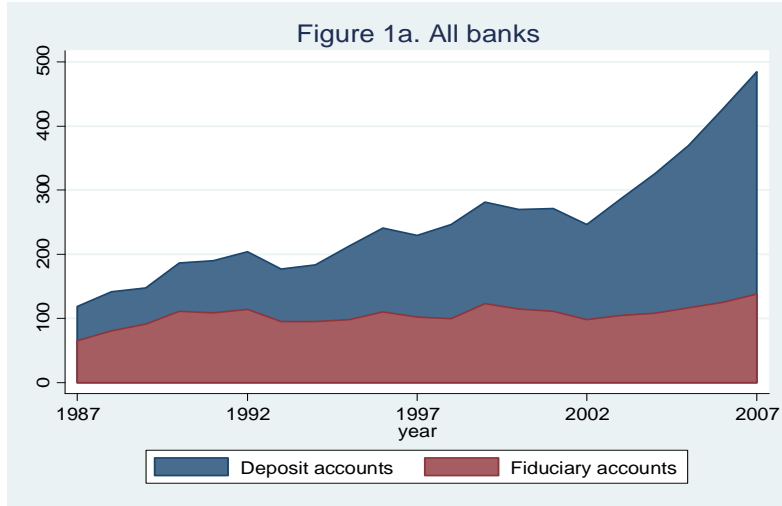


Figure 2. Deposit and Fiduciary accounts in percent of GDP - OECD Countries

The figure shows for each OECD country the variables *Deposits / GDP* and *Fiduciary / GDP* (mean 2000 - 2007). Each country is coded according to the World Bank country code. For definitions of all variables see Table 1.

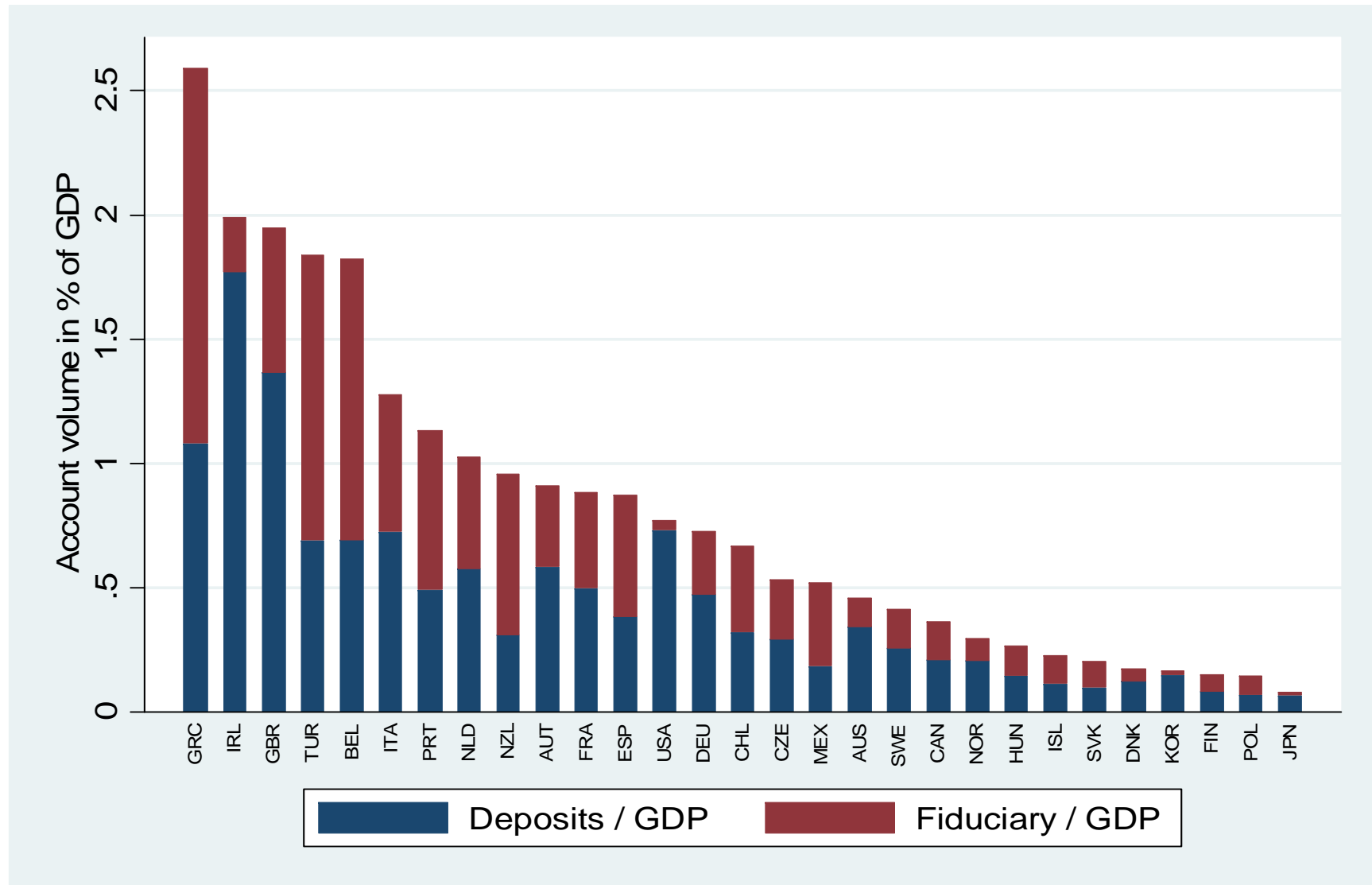


Figure 3. Deposit and Fiduciary accounts in % of total cross-border deposits - OECD countries

The figure shows for each OECD country the variable *Accounts /BIS* (mean 2000 - 2007). Each country is coded according to the World Bank country code. For definitions of all variables see Table 1.

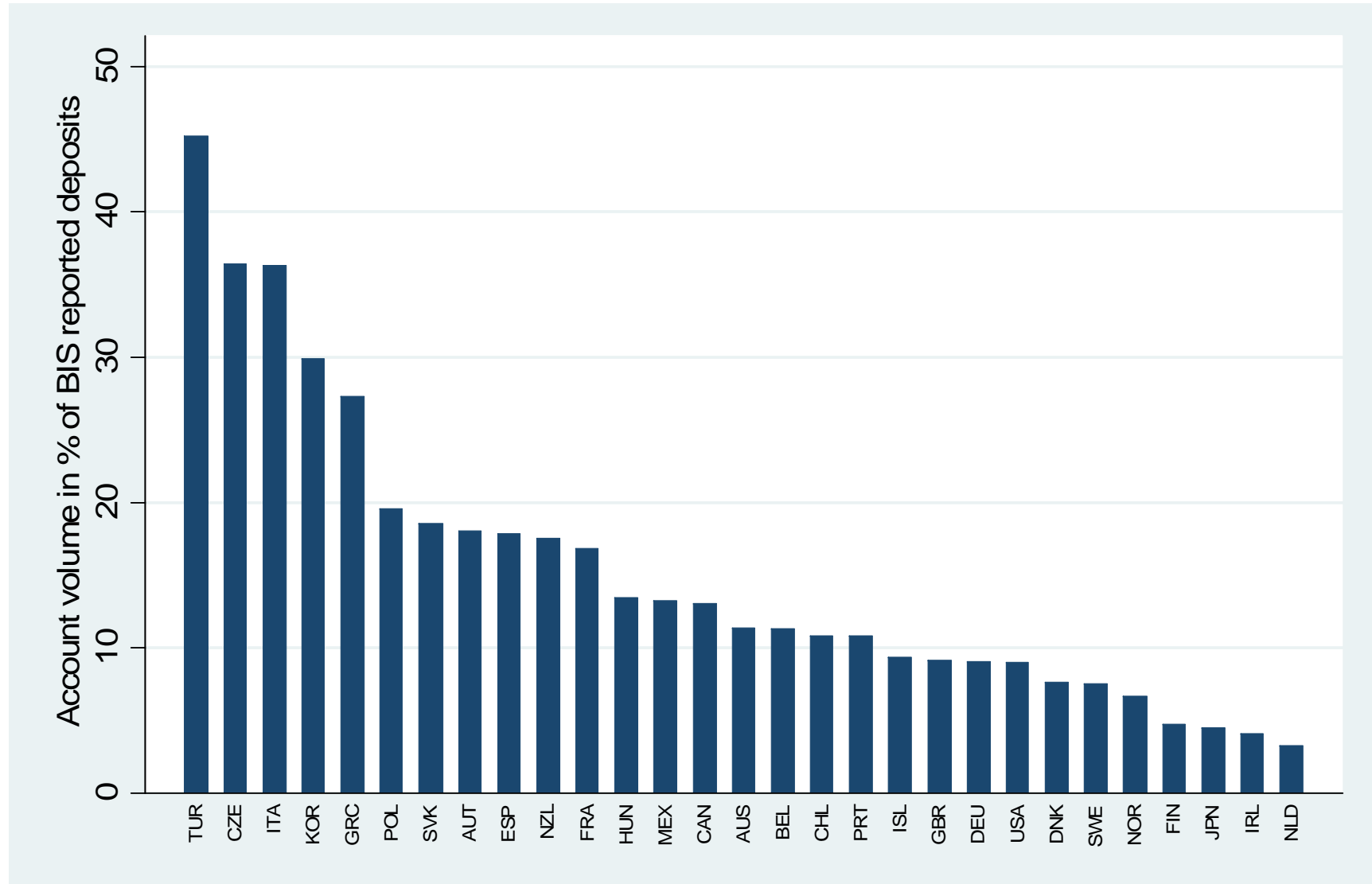


Figure 4. Accounts with Swiss banks, Taxes, and Governance: OECD countries

The figure plots the variables *Accounts / GDP*, *BIS Deposits / GDP* and *Accounts / BIS* (means 2000-2007) against the year 2000 values of the variables *Tax rate* and *Political risk* respectively. For definitions of all variables see Table 1.

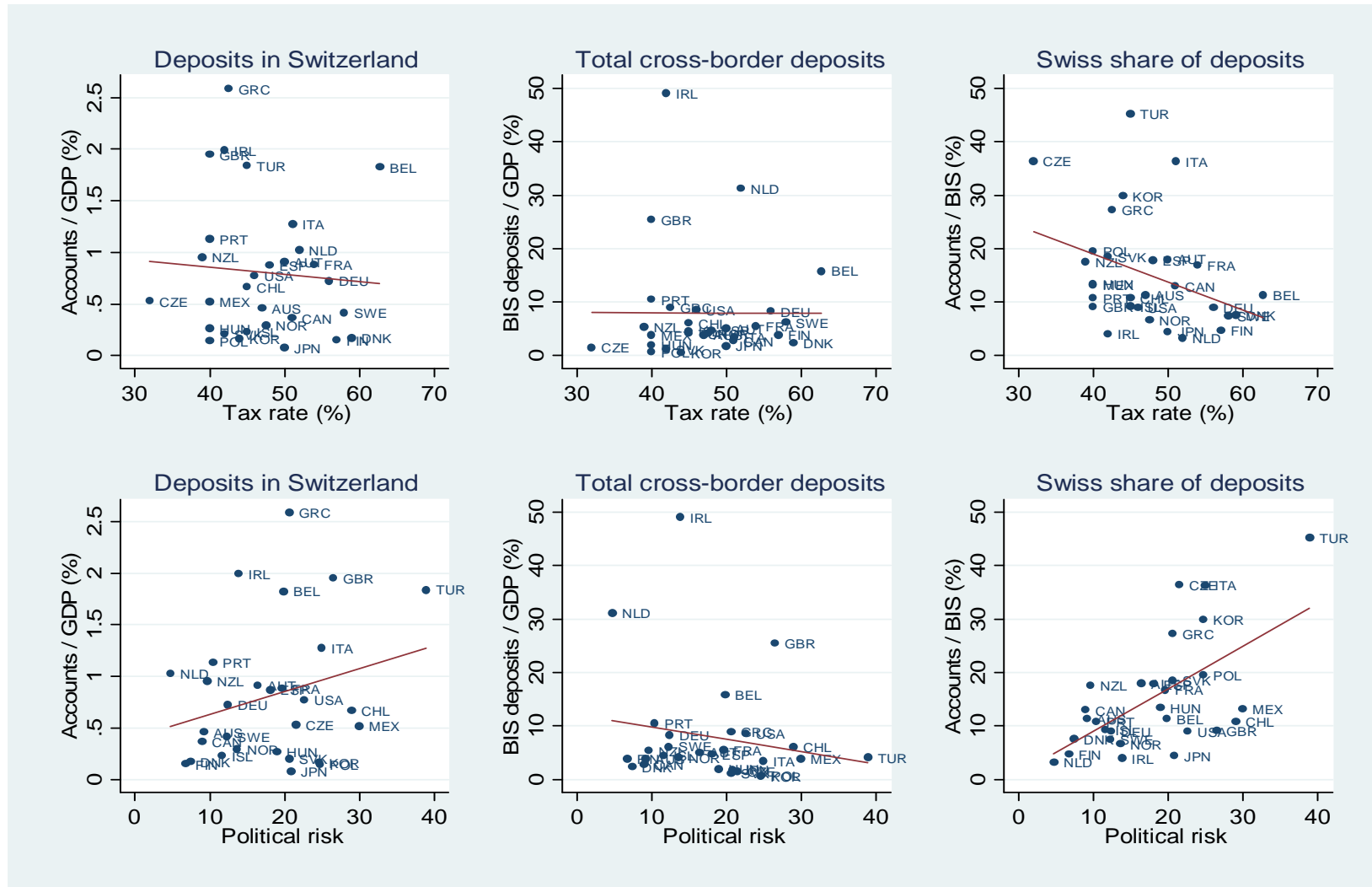


Figure 5. Accounts with Swiss banks, Taxes and Governance: OECD and Non-OECD countries

The figure plots the variables *Accounts / GDP*, *BIS Deposits / GDP* and *Accounts / BIS* (means 2000-2007) against the year 2000 values of the variables *Tax rate* and *Political risk* respectively. For definitions of all variables see Table 1.



Table 1. Variable definitions and sources

Variable name	Definition	Source	Period available
Accounts with Swiss Banks			
Deposits / GDP	Deposit accounts volume, in % of origin country GDP	SNB	1987-2007
Fiduciary / GDP	Trustee accounts volume, in % of origin country GDP	SNB	1987-2007
Accounts / GDP	Deposit and Trustee accounts volume, in % of origin country GDP	SNB	1987-2007
Accounts / BIS	Deposit and Trustee accounts volume, in % of BIS reported cross-border deposits and trustee accounts	SNB	1995-2007
BIS deposits / GDP	BIS reported cross-border deposits and trustee accounts in % of origin country GDP	SNB	1995-2007
Taxation and Institutions			
Tax rate	Top marginal income tax rate (%)	FI	1985-2005
Political risk	ICRG political risk rating (0=low, 100=high)	ICRG	1987-2007
Fundamentals			
GDP per capita	GDP per capita in log USD	WDI	1987-2007
Trade with CH	Export & Imports to/from Switzerland, log (% of GDP)	DOTS	1987-2007
Distance	Distance between capitals in ln kilometers	CEPII	.

Sources: SNB: Swiss National Bank. FI: Fraser Institute, Economic Freedom of the World; www.freetheworld.com. ICRG: International Country Risk Guide; www.prsgroup.com. WDI: World Bank, World Development Indicators. DOTS: IMF Direction of Trade Statistics. CEPII: Centre d'Etudes Prospectives et d'Informations Internationales.

Table 2. Summary Statistics - Cross-sectional data

This table provides summary statistics for all variables used in our cross-sectional analysis. For each country the underlying value is the mean value for the period 2000-2007 for all variables except *Tax rate* and *Political risk*, for which we report the year 2000 values. See Table 1 for the definition and source of each variable.

Panel A. OECD countries

Variable name	Countries covered	Mean	Std. Dev.	Min	Max
Deposits / GDP	29	0.4	0.4	0.1	1.8
Fiduciary / GDP	29	0.4	0.4	0.0	1.5
Accounts / BIS	29	15.3	10.6	3.3	45.2
BIS deposits / GDP	29	8.0	10.5	0.6	49.1
Tax rate	29	47.1	7.2	32.0	62.7
Political risk	29	17.9	8.0	4.8	38.9
GDP per capita (USD)	29	25'881	13'319	5'411	55'391
Trade with CH (% GDP)	29	0.89	0.79	0.12	3.11
Distance (1'000 km)	29	3.88	5.08	0.44	19.01

Panel B. OECD & Non-OECD countries

Variable name	Countries covered	Mean	Std. Dev.	Min	Max
Deposits / GDP	90	0.7	1.2	0.1	9.4
Fiduciary / GDP	90	1.0	1.8	0.0	11.9
Accounts / BIS	90	21.2	17.2	3.3	97.7
BIS deposits / GDP	90	9.0	11.3	0.6	62.3
Tax rate	90	37.5	14.0	0.0	65.0
Political risk	90	30.6	13.0	4.8	67.9
GDP per capita (USD)	90	11'355	13'499	115	55'391
Trade with CH (% GDP)	90	0.5	0.6	0.0	3.1
Distance (1'000 km)	90	5.5	4.1	0.4	19.0

Table 3. Spearman Rank Correlations - Crosssectional data

This panel reports pairwise Spearman rank correlations for all variables used in our cross-sectional analysis. See Table 1 for the definition and source of each variable. * denotes significance at the 5% level.

Panel A. OECD countries (n=29)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
[1] Deposits / GDP	1								
[2] Fiduciary / GDP	0.67 *	1							
[3] Accounts / BIS	0.06	0.32	1						
[4] BIS deposits / GDP	0.75 *	0.57 *	-0.45 *	1					
[5] Tax rate	0.03	-0.12	-0.40 *	0.16	1				
[6] Political risk	0.18	0.16	0.51 *	-0.18	-0.40 *	1			
[7] GDP per capita	0.10	-0.31	-0.75 *	0.37 *	0.53 *	-0.54 *	1		
[8] Trade with CH	0.27	0.22	-0.01	0.25	0.27	-0.27	0.18	1	
[9] Distance	-0.27	-0.25	-0.11	-0.15	-0.24	0.01	-0.10	-0.83 *	1

Panel B. OECD and Non-OECD countries (n=90)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
[1] Deposits / GDP	1								
[2] Fiduciary / GDP	0.71 *	1							
[3] Deposits / BIS	0.45 *	0.49	1						
[4] BIS deposits / GDP	0.61 *	0.69 *	-0.16 *	1					
[5] Tax rate	-0.09	-0.15	-0.14	-0.07	1				
[6] Political risk	0.08	0.25 *	0.35	-0.05	-0.32 *	1			
[7] GDP per capita	0.05	-0.18	-0.24	0.04	0.39 *	-0.83 *	1		
[8] Trade with CH	0.21 *	0.03	0.10	-0.02	0.23 *	-0.45 *	0.53 *	1	
[9] Distance	-0.06	0.03	0.00	0.05	-0.42 *	0.38 *	-0.45 *	-0.74 *	1

Table 4. Summary Statistics - Panel data

This table provides summary statistics for all variables used in our panel analysis. For each country and period the underlying value of each variable is the mean value per period, except for the variables *Tax rate* and *Political risk* for which the underlying value per country and period is the value at the beginning of the period. See Table 1 for the definition and source of each variable.

Panel A. OECD countries (n=29)

Variable name	1987-1989	1990-1994	1995-1999	2000-2004	2005-2007
Deposits / GDP	0.41	0.41	0.46	0.46	0.44
Fiduciary / GDP	0.60	0.56	0.46	0.42	0.25
Deposits / BIS	.	.	19.0	16.8	12.8
BIS deposits / GDP	.	.	5.7	7.4	9.0
Tax rate	65.3	52.4	49.8	47.1	43.7
Political risk	23	24	22	18	17
GDP per capita (USD)	14'083	17'437	19'191	21'929	32'469
Trade with CH (% GDP)	0.85	0.77	0.81	0.89	0.89
Distance (1'000 km)	4.53	4.38	3.88	3.88	3.88

Panel B. OECD & Non-OECD countries (n=99)

Variable name	1987-1989	1990-1994	1995-1999	2000-2004	2005-2007
Deposits / GDP	0.69	0.67	0.62	0.69	0.74
Fiduciary / GDP	1.39	1.28	0.90	1.07	0.83
Deposits / BIS	.	.	22.3	22.4	19.5
BIS deposits / GDP	.	.	7.1	8.3	9.7
Tax rate	59	48	41	38	34
Political risk	41	41	31	31	30
GDP per capita (USD)	6'679	7'305	8'699	9'509	13'299
Trade with CH (% GDP)	0.64	0.52	0.52	0.53	0.50
Distance (1'000 km)	6.20	6.25	5.88	5.54	5.46

Table 6. OECD Countries: Panel regressions

This table reports panel regressions based on the subsample of OECD countries. All dependant variables are measured in logs. Robust standard errors are reported in brackets. ***, **, * denote significance at the 1%, 5%, 10% level respectively. For definitions and sources of the variables see Table 1.

Dependent variable (log):	Accounts / GDP			Accounts/ GDP	Fiducary / GDP
	<i>All Banks</i>	<i>All Banks</i>	<i>All Banks</i>	<i>Other Banks</i>	<i>All Banks</i>
Model:	[1]	[2]	[3]	[4]	[5]
Tax rate	0.0073 [0.00931]		0.00799 [0.00927]	-0.00122 [0.00960]	0.000441 [0.00970]
Political risk		0.0107 [0.00988]	0.0146 [0.00994]	0.0124 [0.0103]	0.0118 [0.0104]
GDP per capita	-0.233 [0.283]	0.227 [0.304]	0.00158 [0.323]	-0.431 [0.335]	-0.294 [0.338]
Trade with CH	0.503** [0.213]	0.596*** [0.210]	0.484** [0.212]	0.537** [0.220]	0.277 [0.222]
Observations	124	140	124	124	124
R-squared	0.202	0.123	0.242	0.253	0.242
Countries	29	29	29	29	29
Country fixed effects	yes	yes	yes	yes	yes
Period fixed effects	yes	yes	yes	yes	yes
Model	OLS	OLS	OLS	OLS	OLS

Table 8. All Countries: Panel regressions

This table reports panel regressions based on the full sample of OECD and Non-OECD countries. All dependant variables are measured in logs. Robust standard errors are reported in brackets. ***, **, * denote significance at the 1%, 5%, 10% level respectively. For definitions and sources of the variables see Table 1.

Dependent variable (log):	Accounts / GDP			Accounts/ GDP	Fiducary / GDP
	<i>All Banks</i>	<i>All Banks</i>	<i>All Banks</i>	<i>Other Banks</i>	<i>All Banks</i>
Model:	[1]	[2]	[3]	[4]	[5]
Tax rate	0.000614 [0.00363]		-0.000444 [0.00363]	0.000183 [0.00394]	-0.0041 [0.00407]
Political risk		0.0112** [0.00457]	0.0113** [0.00461]	0.00986** [0.00500]	0.00943* [0.00517]
GDP per capita	-0.427*** [0.129]	-0.346*** [0.128]	-0.349*** [0.131]	-0.433*** [0.143]	-0.547*** [0.148]
Trade with CH	0.207** [0.0879]	0.179** [0.0877]	0.179** [0.0880]	0.0478 [0.0955]	0.023 [0.0988]
Observations	405	405	405	405	405
R-squared	0.076	0.095	0.095	0.101	0.197
Countries	99	99	99	99	99
Periods	5	5	5	5	5
Country fixed effects	yes	yes	yes	yes	yes
Period fixed effects	yes	yes	yes	yes	yes
Model	OLS	OLS	OLS	OLS	OLS

Table 10. Effect of the 2005 EU savings directive

This table reports panel regressions based on the sub-sample of OECD countries. In columns 1-3 we compare 2004 to 2005 volumes of *Accounts / GDP*, *Deposits / GDP* and *Fiduciary / GDP* per country. In these columns the dummy variable Savings directive is 1 for the year 2005 and 0 for the year 2004. In columns 4-6 we compare 2002-2004 average volumes of *Accounts / GDP*, *Deposits / GDP* and *Fiduciary / GDP* per country to the 2005-2007 average volumes. In these columns the dummy variable Savings directive is 1 for the period 2005-2007 and 0 for the period 2002-2004. The dummy variable EU15 is 1 for all EU15 countries and 0 for all other OECD countries. All dependant variables are measured in logs. Robust standard errors are reported in brackets. ***, **, * denote significance at the 1%, 5%, 10% level respectively. For definitions and sources of the variables see Table 1.

Countries	OECD			OECD		
	2004 vs. 2005			2002-2004 vs. 2005-2007		
Dependent variable (log):	<i>Accounts / GDP</i>	<i>Deposits / GDP</i>	<i>Fiduciary / GDP</i>	<i>Accounts / GDP</i>	<i>Deposits / GDP</i>	<i>Fiduciary / GDP</i>
Model:	[1]	[2]	[3]	[4]	[5]	[6]
Savings directive	0.107 [0.0699]	0.0571 [0.0819]	0.143 [0.0859]	0.139 [0.108]	0.159 [0.118]	-0.00148 [0.111]
Savings directive * EU15	-0.307*** [0.101]	-0.168 [0.118]	-0.507*** [0.124]	-0.390** [0.156]	-0.293* [0.170]	-0.433** [0.159]
Constant	-0.676*** [0.0356]	-1.218*** [0.0416]	-1.777*** [0.0437]	-0.630*** [0.0552]	-1.222*** [0.0600]	-1.613*** [0.0563]
Observations	58	58	58	58	58	58
R-squared	0.269	0.075	0.42	0.197	0.1	0.348
Countries	29	29	29	29	29	29
Country fixed effects	yes	yes	yes	yes		yes
Model	OLS	OLS	OLS	OLS	OLS	OLS