So close and yet so far: The ability of mandatory disclosure rules to crack down on offshore tax evasion*

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Abstract

We study the effect of mandatory disclosure rules on aggressive tax planning arrangements. We focus on the one introduced in 2018 under the Council Directive 2018/288/EU (or DAC6) and study its effect on tax evasion. We show a reduction of cross-border deposits in EU countries with a strong enforcement but also a relocation of funds to countries with limited intermediary reporting obligation. Finally, we detect an increase of USD 14 billion in cross-border deposits held by residents of countries offering citizenship/residence by investment programs, suggesting the use of these schemes as regulatory arbitrage to circumvent the disclosure mandated under DAC6.

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1 Introduction

On August 24, 2022, the chair of the Senate Finance Committee, Ron Wyden, released the findings of a year-long investigation concerning allegations of what has been called "the largest tax evasion case brought against an individual in U.S. history". Robert Brockman, a former CEO of an Ohio-based software company, was accused of concealing approximately USD 2.7 billion in income from the IRS through the so-called "shell bank" loophole, a scheme involving the use of offshore entities and secret bank accounts to escape the reporting duty under the Foreign Account Tax Compliance Act (FATCA) (US Senate Finance Committee (2022)).

Globally collecting tax revenues has become increasingly challenging. As the above case suggests, the pervasive use of complex legal structures to hide wealth and related income overseas and evade tax obligations at home is a great concern to policymakers. The related revenue loss has been estimated to be approximately USD 200 billion annually (Zucman (2013)), and is mainly attributed to the top 0.1% highest earners as empirical evidence shows (Alstadsæter et al. (2018), Guyton et al. (2021)). Recent evidence from several leaks, such as the Panama Papers in 2016, the Paradise Papers in 2017, the Pandora Papers in 2021, and the Suisse Secrets in 2022 revealed, just as in the "shell bank" loophole, the key role played by tax advisors, lawyers, financial institutions, and other intermediaries in supporting the world's economic elite in under-reporting income and wealth in their respective country of residence.

In this study, we investigate the effect of an innovative reporting standard, called mandatory disclosure rules (MDRs) which has the power to prevent individuals from exploiting tax evasion schemes such as the "shell bank" loophole. Specifically, an MDR targets enablers of cross-border tax evasion by requiring them to disclose their clients' tax schemes. In contrast to existing tax transparency initiatives like FATCA of the U.S. and the Common Reporting Standard (CRS) of the OECD, the key innovation of MDRs is that it requires intermediaries, such as consultants, lawyers, or financial institutions, to report a comprehensive set of information on all currently used transactions which have certain elements of tax aggressiveness

to local tax authorities.[1] In this way, tax authorities obtain information that is not limited to a specific channel of tax evasion, e.g., financial assets in case of FATCA and CRS, but rather extends to all types of tax-aggressive arrangements.

The U.S. was one of the first country to introduce MDRs in the 1980s. Nowadays, MDRs exist in several countries around the world.[2] We focus on the one introduced in the EU in June 2018 under the EU council directive (European Council (2018/822/EU)), also known as DAC6. While other countries have domestic MDRs, the EU is the first to introduce this new disclosure rule under a multilateral approach where the information collected under DAC6 is automatically exchanged across EU member states. An MDR like the one under DAC6 can enhance the speed and accuracy of the assessment of whether a transaction is created only for the purpose of evading taxes. For example, under the UK MDR, more than 3,000 transactions have been reported over 7 years and legislation has been changed in relation to almost 600 reported transactions (Devereux et al. (2012)). Anecdotal evidence from the U.S. MDR suggests that it was key in countering the expansion of corporate tax shelters in the early 2000s (Noked and Marcone (2022)).

Similarly, EU tax authorities can largely benefit from the information collected under DAC6. Assume, for example, a scheme similar to the one used in the "shell bank" case: a resident of an EU country sets up a private entity in the Cayman Islands and holds financial assets in Luxembourg through this entity. Once the private entity obtains the status of "Financial Institution", the reporting duty is shifted from the financial institution in Luxembourg that maintains the financial accounts of the entity to the private entity itself. In this way, the third party reporting turns into a self-reporting obligation where the taxpayers can opt for not-reporting the income overseas to the tax authority as evident in the "shell bank" case. However, after the implementation of DAC6, the moment a client enters into or is advised on a transaction that features elements of tax aggressiveness, the intermediary has to report all the information about it to the tax authority. If a financial institution

[1]Information to be reported includes, amongst others, a summary of the content of the transaction, the value of the transaction, the identification detail of the intermediaries, and of the relevant taxpayers. The reporting obligation extends to the taxpayers, for example, in case the intermediary may claim legally recognized professional secrecy or the intermediary is not a resident of the EU or there is no intermediary involved in a transaction.

[2]For an overview of existing MDRs, see Noked et al. (2022)

is providing a service that is used by the client in connection to a reportable cross-border arrangement, e.g., accepting wire transfers of large amounts into accounts owned by private entities falling outside the CRS due diligence requirements, the financial institution has to report information on the client's identity and the details on which type of transactions has been used and the value of it to the local tax authority.[3] In this way, every EU tax authority would obtain detailed information on any cross-border transaction that is used to circumvent the automatic information exchange agreements and to obscure true beneficial ownership (see Hallmark D of European Council (2018/822/EU)).

Moreover, regulating the conduct of intermediaries by mandating the disclosure of their clients' tax schemes can have a deterrent effect. The EU commission stated that it *"should be expected that the mandatory disclosure of potentially aggressive tax planning schemes would dissuade intermediaries from designing and marketing such schemes"* (European Commission (2017)). Advising on tax-aggressive arrangements after DAC6 involves increased compliance and reputational costs as well as a higher detection risk (Noked and Marcone (2022)). Thus, DAC6 has the power to make the involvement in such tax schemes less attractive.

We focus our analysis on how the introduction of DAC6 affects cross-border deposits of EU residents, who are potentially experiencing a change in the detection risk, and compare their behaviour to the one of non-EU OECD residents who are unaffected by DAC6, but face a similar economic and fiscal environment. For resident in EU countries, we expect a reaction to the new disclosure requirements (Allingham and Sandmo (1972), Slemrod (2019)). If DAC6 is able to crack down on offshore tax evasion, we should expect an increase in the incentives to report previously undisclosed offshore deposits in EU countries.

We address this question by investigating the direct effect of DAC6 on EU resident behaviour and the indirect effect of DAC6 on the use of citizenship and residence by investment schemes. Specifically, we estimate tax evaders' reaction to a mandatory disclosure rule of aggressive tax arrangements at a within-country time and country-pair level by using a difference-in-difference design. We follow the related literature on cross-border tax evasion (e.g. Huizinga and Nicodème (2004); Johannesen and Zucman (2014); Menkhoff and Miethe

[3]For more details on the implications of DAC6 for financial institutions, see https://www.ey.com/en_be/financial-services/are-you-ready-for-dac-6.

(2019); Casi et al. (2020)) and proxy tax evasion behaviour by considering the outstanding volume of cross-border deposits placed in tax havens. The data originates from the Bank for International Settlements (BIS). Our sample period is from the first quarter of 2017 to the last quarter of 2019 to avoid confounding events affecting cross-border deposit movements like the introduction of the CRS and the COVID19 pandemic.[4]

We begin our analysis by investigating the direct effect of DAC6 on tax evaders by focusing on EU residents, who are the ones experiencing the change in detection risk. We compare their behaviour pre and post DAC6 to the one of non-EU OECD residents as the latter is a suitable control group in our sample. Non-EU OECD residents (henceforth non-EU residents for convenience) face a similar economic and tax environment and are, at the same time, not affected by DAC6 because the information collected under DAC6 is not exchanged with their respective country of residence. We estimate the changes in cross-border deposits of EU residents compared to those of non-EU residents pre and post DAC6 combining a regression analysis and an event study design. Our results indicate that deposits of EU residents in the EU increase by 11% post DAC6, while no change in cross-border deposits outside the EU is detected, suggesting that the policy is effective. The detected increase in cross-border deposits in the EU from EU residents can originate either from a relocation of deposits from other non-CRS participants countries outside our sample or from the relocation of funds of non-reportable financial assets (e.g. crypto-currency) and/or non-reportable financial institutions (e.g. trust) to reportable financial assets (i.e. bank deposits) since now such arrangements are reportable under DAC6. When considering the economic relevance of our main estimate, DAC6 led to an increase of USD 124 billion in cross-border deposits held by EU residents in the EU.

However, we also show that DAC6 is still far away from a perfect policy tool against tax evasion. We highlight this by investigating cross-country differences in regulatory environments. First, countries differ in monetary penalties. Usually countries impose a maximum monetary penalty of less than EUR 100,000 per non-compliant institution, regardless of the value and volume of the non-disclosed or wrongly disclosed transaction (Casi et al. (2021)). Only Spain refrains from setting an upper limit and instead charges a penalty that is pro-

[4]We offer evidence on a longer time period in appendix A3.

portional to the value of the incorrectly reported transaction or to the related intermediary fee. Our results show a statistically significant decrease in deposits of approximately 16% in Spain post DAC6 suggesting tax evaders withdraw funds from countries where compliance under DAC6 is expected to be higher given the high penalty.

Second, countries differ in the definition of who enjoys the legal professional privilege with respect to the reporting duty. Most EU member states restrict it to lawyers, tax advisers, and accountants, but few extend it to financial institutions. Enjoying the legal professional privilege impacts the actual obligations under DAC6 since the reporting duty is shifted from the intermediary to the taxpayers.[5] The detection risk under DAC6 is, therefore, arguably reduced in those countries where the reporting obligation for an intermediary is restricted as evident from the "shell bank" case (US Senate Finance Committee (2022)). According to national law, France extends the legal professional privilege to financial intermediaries. Our findings suggest that the generous scope for the legal professional privilege granted by France induced a relocation of income and wealth. Specifically, we find an approximately 30% increase in cross-border deposits in France post DAC6.

In the second part of our study, we analyze whether taxpayers are able to circumvent reporting under DAC6 altogether by exploiting citizenship-by-investment programs (CBI) or residence-by-investment programs (RBI). Anecdotal evidence suggests that such schemes have been used for tax evasion purposes, especially to circumvent the reporting duty under the automatic exchange of information agreements, e.g., under the CRS (Christians (2017); Mehboob (2019); European Parliament (2016)). In the context of DAC6, an EU taxpayer could make use of multiple citizenship/residence rights to channel a cross-border arrangement outside the EU and, in this way, avoid the reporting duty under DAC6. This is possible because the access to multiple citizenship and residence rights enables tax evaders to select the country where the transaction originates. Our results show a statistically significant increase of 30% in cross-border deposits owned by residents of CBI/RBI countries compared

[5]Anecdotal evidence shows that whether or not a client's advisor enjoys the legal professional privilege affects the final decision over which company to hire for tax planning service. Specifically, in EU member states where the legal professional privilege for DAC6 reporting duty is restricted to lawyers, the big four accounting firms have experienced a significant loss of clients moving to law firms for tax advisory service. For more details, see International Tax Review, 10 February 2020, "Taxpayers moving away from the Big Four to law firms for advice", available at https://www.internationaltaxreview.com/article/b1k8t2wlbsvj04/taxpayers-moving-away-from-the-big-four-to-law-firms-for-advice.

to residents of non-CBI/RBI countries post DAC6. When considering the economic size of the effect we detect, this translates into an approximately USD 14 billion increase of cross-border deposits held by CBI/RBI residents in the deposit locations outside EU post-DAC6, of which USD 7 billion are in tax havens outside the EU. Our findings provide evidence of the use of these schemes as regulatory arbitrage to circumvent the disclosure mandated under DAC6.

We provide several robustness checks for corroborating the validity of our main results. We run a placebo test where we only consider residents of Ireland, Portugal and UK since these countries had a similar disclosure rule already in place before DAC6 and we confirm that, as expected, no statistically significant difference in cross-border deposits between treatment and control group occurs. In addition, we validate that our baseline results are not driven by the control group in a split test where results for the treatment and control group are plotted separately. We also test the reliance of our identification on our choice of fixed effects, by modifying the fixed effect structure of our main results. Finally, we prove the validity of our results using a longer sample period.

Overall, our study contributes to the literature on regulations targeting illicit financial flows. So far, mixed results emerged on the effectiveness of tax transparency in curbing tax evasion. While tax evaders reacted to the agreements to exchange information by reducing wealth and related income in cooperative jurisdictions, these funds haven't been repatriated but have been reallocated to tax havens not covered by such information exchange agreements (e.g., Johannesen and Zucman (2014), Menkhoff and Miethe (2019), De Simone et al. (2020), Casi et al. (2020)). An MDRs like the one under DAC6 is considered to have the potential to close all loopholes in the existing global tax transparency framework (Noked and Marcone (2022)). Our study shows that DAC6 has certain important elements of weaknesses. From Langenmayr and Zyska (2021), we know that the introduction of CBI/RBI programs led to an increase of cross-border deposits to tax havens. However, their identification strategy does not allow them to verify whether individuals enter in such programs for tax evasion reason or are in search of visa-free travel, political stability and/or financial security. Instead, using an exogenous policy shock, we are able to document that the use of CBI/RBI represents a regulatory arbitrage strategy to escape the reporting of information on the use of cross-border

transactions used for aggressive tax planning purpose.

We also contribute to the literature on tax enforcement. Overall, government attention to tax compliance increased largely after the financial crises as a result of the substantial deficits (International Monetary Fund (2015), p. 6) and enhancing tax compliance is now a top priority for policymakers given the massive economic shocks from the COVID19 pandemic. There is a vast literature that studies the effect of stricter enforcement rules on tax compliance (e.g. Fack and Landais (2010), Kleven et al. (2011), Kopczuk et al. (2016), Carrillo et al. (2017), Almunia and Lopez-Rodriguez (2018)). We focus on cross-border tax evasion and investigate the effect of mandating the automatic collection and exchange of information on aggressive tax arrangements on underreported income and wealth held abroad. Specifically, we address the call from Slemrod (2019) on understanding the role of tax professionals in administration and enforcement as well as the importance of the penalty level for noncompliance.

Finally, the results of our study inform policymakers given the current global debate on the necessity to revise the rules for tax advisory services.[6] Our study sheds light on the effectiveness of increasing disclosure mandate for intermediaries on their clients' tax schemes. We provide evidence of the relevance of imposing sufficiently high enforcement to ensure compliance and of restricting the professional legal privilege to ensure third-party reporting. In doing so, we offer important insights to the EU member states as well as to those countries outside the EU that have similar mandatory intermediary disclosure requirements or are considering introducing them. We also contribute to the international debate on the risk related to CBI/RBI programs. Both the EU and the OECD expressed concerns on the misuse of these programs (European Commission (2022), European Parliament (2018); OECD (2020)). The results of our study offer novel empirical evidence to support the policy debate in this area.

The rest of the paper is organized as follows. Section 2 outlines the institutional background. Section 3 develops our testable hypotheses. Section 4 describes our data and research methodology, while section 5 presents our main empirical results. Section 6 summarizes the

[6]Recently the EU commission launched a consultation on the topic, see https://www.etaf.tax/index.php/newsarea/300-weekly-tax-news-11-july-2022

robustness checks and section 7 concludes.

2 Institutional Background

2.1 The EU's Mandatory Disclosure Rule

In 2010, the introduction of FATCA in the U.S. enabled the development of an extremely powerful standard for the AEOI in tax matters. This policy tool was enacted with the ambition to overcome the weakness of previous initiatives in the field and, in this way, to finally put an end to the substantial tax revenue loss resulting from U.S. citizens hiding income and wealth offshore. It obliges foreign financial institutions to collect financial account information on behalf of their clients if they are U.S. citizens and to automatically transmit them to the IRS. The introduction of FATCA pushed an international discussion at the OECD level on developing a global standard for the AEOI. On 21 July 2014, the OECD published the final version of the global standard for automatic exchange of financial account information in tax matters, the CRS. Currently, more than 100 jurisdictions around the world have implemented the CRS. Given the broad scope and the extensive country coverage, the AEOI information system under FATCA and the CRS presents certain key features that make it substantially different from any initiative in the field launched so far. The true revolution in the level of scrutiny of illicit financial flows held overseas would considerably redesign the cross-border tax evasion schemes detected so far. And, indeed, FATCA and CRS have been successful in reducing international tax evasion via tax havens resulting in significant additional reporting of accounts (e.g. De Simone et al. (2020), Casi et al. (2020), Menkhoff and Miethe (2019)), especially of the highest earning individuals (Johannesen et al. (2020)). However, indirect evidence also suggests that wealth and income are relocated to non-reportable assets, e.g. real estate and luxury goods, and to non-cooperative jurisdictions (e.g. De Simone et al. (2020), Casi et al. (2020), Bomare and Herry (2022)).

In June 2018, the sixth amendment to the Directive on Administrative Cooperation was introduced with the ambition to close the loopholes detected in previously launched tax transparency initiatives. The Directive on Administrative Cooperation (European Council

(2011/16/EU) or DAC1) is a legal instrument introduced at the EU level in 2011 with the aim to increase the automatic collection and exchange of information across EU tax authorities. Under DAC1, information on every type of tax, other than VAT, customs duties, excise duties and social security contributions could be exchanged upon request across Member States within a six-month period. In this way, DAC1 ensures that the OECD standard for the exchange of information on request is implemented in the EU. Subsequent amendments to DAC1 introduced global tax transparency initiatives within the EU. Specifically, in 2014, the Council Directive 2014/107/EU or DAC2 introduced the CRS at EU level. In 2015, the Council Directive 2015/2376/EU or DAC3 introduced a proper definition of advanced cross-border rulings as well as advanced pricing arrangements and imposed the automatic exchange of information of those. In 2016, the Council Directive 2016/881/EU or DAC4, introduced the requirement for country-by-country (CbC) reports at the EU level as proposed under Action 13 of the Base Erosion and Profit Shifting (BEPS) project.[7] Council Directive 2016/2258/EU or DAC5, introduced in 2016, forces local financial institutions to identify and report to the respective tax authority the information on the beneficial owner of an intermediary structure.

Revelations from tax scandals such as the "Paradise Papers" and the "Panama Papers" publicized by the International Consortium of Investigative Journalists (ICIJ) raised concerns regarding the pervasive use of harmful tax practices and the necessity to strengthen the fight against tax evasion and tax avoidance (European Parliament (2016)). In particular, the role of certain financial institutions and other intermediaries played in supporting clients to establish complex legal structures with the only intent of evading tax obligations emerged. At the informal meeting of the Economic and Financial Affairs Council in April 2016, member states welcomed initiatives, such as those stated in BEPS Action 12, requiring taxpayers and advisors to disclose aggressive tax planning arrangements.[8] As a result, the EU adopted the

[7]Empirical evidence on the impact of DAC2 and DAC3 provide mixed evidence on their effectiveness. Casi et al. (2020) shows that the introduction of the CRS at EU level did not trigger a strong reaction from tax evaders given the existence of the automatic collection and exchange of interest income under the Savings Directive. Instead, the duty of large corporations to disclose country-level economic activity to tax authorities, as the one mandated under DAC3, induced a reallocation of investment to the EU, but mainly in those countries offering preferential tax regimes (Olbert and De Simone (2021)). Overall, only weak evidence of improved tax compliance has been detected (Joshi (2020)).

[8]For more details on the BEPS Action 12, see OECD (2013), page 22-23.

council directive 2018/822/EU or DAC6 in May 2018, which represents the sixth amendment to the Directive on Administrative Cooperation.

Under DAC6, a comprehensive set of information on the cross-border arrangements needs to be reported to the local tax authorities if certain criteria are met.[9] One of the most important criteria is that the cross-border arrangement needs to involve at least one EU country. Moreover, cross-border arrangements have to be reported if they display certain pre-defined characteristics, called "hallmarks." The definition of the selected hallmarks mainly reflects those in Action 12 of the BEPS initiative and includes generic and specific hallmarks. In particular, generic hallmarks include all arrangements embracing three elements: confidentiality, intermediary fee, and standardized documentation. The generic hallmark must be considered only if it can be proven that the main benefit of a cross-border arrangement is to gain a tax advantage. If this occurs, the main benefit test is satisfied, and the cross-border arrangement must be reported to the respective authority. Specific arrangements include four types of arrangements. First, it embraces all arrangements that satisfy the main benefit test and enable the taxpayer to use losses to reduce a tax liability, to convert income into capital, gifts, or other categories of revenue, which are taxed preferentially or to exploit circular transactions resulting in round-tripping of funds. Second, it comprises all cross-border arrangements that aim at circumventing the requirements under AEOI legislation or agreements across EU member states. Third, it encompasses all cross-border arrangements involving deductible cross-border payments between two or more parties if certain conditions are met, namely depreciation of the same asset in multiple jurisdictions, multiple relief from double taxation on the same claims for more than one taxpayer, or transfers of assets where significant discrepancies exist in the amount being treated as payable with respect to the assets in those jurisdictions involved. Lastly, it concerns transfer pricing and covers all arrangements that do not comply with the arm's-length principle or the OECD transfer pricing guidelines or are within the scope of the automatic exchange of information on advance cross-border rulings but are neither reported nor exchanged.

A comprehensive set of information on the reportable cross-border arrangements is due

[9]For a comprehensive overview of DAC6 and its national implementation across EU member states, see Casi et al. (2021).

within 30 days from the date the scheme is made available. Information to be reported includes a summary of the content of the arrangement, the value of the arrangement, the category of hallmark to which it belongs, the identification detail of the intermediaries, and the relevant taxpayers. In this way, the type of information disclosed under DAC6 is substantially different from the one obtained under the CRS and FATCA as illustrated in Table 1.[10]

Table 1: Comparison of the CRS (DAC2) and MDR (DAC6)

Panel A	**Common Reporting Standard (DAC2)**
The Scope	Information on financial assets held outside the country of residence
Who gets it	Information is exchanged with all CRS-participating jurisdictions
What is obtained	Automatically exchanged information: • Identification information of the account holder, if indirectly owned, on the last beneficial owner • Financial information on the account, including the balance, the interest and/or dividend amount, the amount of other income generated with respect to the assets held in the account, the proceeds from the sale or redemption of financial assets, the amount paid or credited by the reporting financial institution in reference to the account
Panel B	**Mandatory Disclosure Rule (DAC6)**
The Scope	Hallmark D: arrangement which may have the effect of undermining the reporting obligation under the CRS, including transfer of funds to non-participating jurisdictions, non-reportable assets and non-reportable financial institutions
Who gets it	Information is exchanged with EU member states only

[10]In Table 1, we focus our comparison on how DAC6 differs from the CRS. For this reason, we exclusively explain the type of transactions that need to be reported under Hallmark D of DAC6, i.e. the category of transactions that potentially undermine the AEOI under the CRS.

What is obtained	Automatically exchanged information: • Identification information of the intermediaries, and of the relevant taxpayers involved in the reported arrangement • A summary of the content of the arrangement, the value of the arrangement, the category of hallmark to which it belongs, the identification detail of the intermediaries, and of the relevant taxpayers

Under the CRS, tax authorities obtain extensive information on financial assets held in foreign jurisdictions which are participating in the AEOI. Yet, anecdotal and empirical evidence (e.g. De Simone et al. (2020), Casi et al. (2020), Bomare and Herry (2022)) suggests that wealth and income has been relocated to non-reportable jurisdictions and non-reportable assets. DAC6 has been introduced with the aim to close such loopholes and ensure that no possibility of escaping the AEOI within the EU is exploited. This is achieved by mandating the reporting of specific types of transactions that are considered to facilitate the circumvention of the reporting duty under the CRS.[11] The moment a client is advised on a type of transaction listed under DAC6, the advisor has to report all the information about it, including the information on the client receiving the advice and the details on which type of transactions and the value of it.[12]

Besides the establishment of shell entities as in the "shell bank" case, another reportable transaction includes the transfer of income and wealth to a jurisdiction that is not subject to the CRS. Imagine, for instance, a German taxpayer that is transferring its bank account from the Cayman Islands to the Dominican Republic after the CRS is introduced to avoid German tax authorities from automatically obtaining information on it, as the Cayman Islands participates in the CRS while the Dominican Republic does not. After the introduction of DAC6, the German tax authorities would obtain extensive information on the tax advisors and to which clients this type of transaction is advised to. Likewise, transactions involving the transfer of funds to "non-reportable financial assets" or/and "non-reportable financial institutions," as an attempt to avoid the CRS reporting duty, have to be reported to the

[11]For the complete list, see European Council (2018/822/EU), page 12.

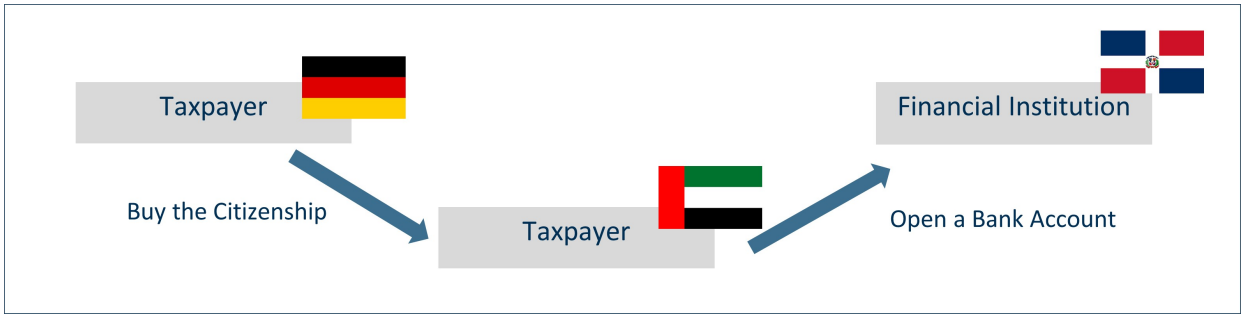
[12]For more explanation, see https://taxnews.ey.com/news/2020-1283-france-publishes-additional-official-tax-guidelines-on-mandatory-disclosure-rules).

respective tax authority. Examples that qualify as non-reportable financial assets and non-reportable financial institutions are the use of certain types of virtual currency or derivatives contracts and the use of trusts, which under certain conditions automatically qualify as active non-financial entities. Thus, DAC6 probably makes transactions that aim to circumvent the AEOI no longer attractive and allows EU tax authorities to close existing loopholes.

2.2 DAC6 and Citizenship/Residence-by-Investment

CBI/RBI programs have been introduced to attract funds from wealthy investors. Such programs offer individuals the possibility to obtain the citizenship or residence rights through local investment or against a flat fee. Survey evidence suggests that among various reasons, individuals opt for entering a CBI/RBI program for tax planning reasons.[13] Anecdotal evidence has highlighted that identity card and similar documentation obtained under CBI/RBI programs has been misused to escape the reporting duty under the CRS.[14] Thus, one could expect that the availability of multiple citizenship and/or multiple residence rights could represent a channel to escape the reporting duty under DAC6. The following simplified example clarifies the mechanism.

Figure 1: Circumventing the DAC6 Reporting Requirement



Notes: This figure provides an example of escaping DAC6 reporting duty using the United Arab Emirates' CBI program.

Assume, for example, an EU taxpayer that set up an investment entity in the Dominican

[13]Specifically, 3% of the surveyed individuals who are interested in CBI/RBI programs answered that the reason is tax-related. Other reasons include education access for children, better lifestyle, and higher security. For more details, see OECD (2018), page 58.

[14]See, for example, Christians (2017), Mehboob (2019), European Parliament (2018), OECD (2020). See also Langenmayr and Zyska (2021) for an analysis that shows how CBI schemes can be an effective tool for tax evaders to avoid the increased detection risk under automatic exchange of information.

Republic through a local bank account after the introduction of CRS. After the implementation of DAC6, every EU tax authority would become aware of every transaction the EU taxpayer conducted involving a EU member state and a CRS non-participating country, like the Dominican Republic. Yet, the tax evader could enter into a transaction in the Dominican Republic using the passport or residence certificate from a CBI/RBI country like the United Arab Emirates and, in this way, circumvent the duty to report the transaction under DAC6 to the true country of residence.

3 Hypotheses Development

The overall objective of the MDR under DAC6 is to guarantee that tax authorities receive early information on cross-border arrangements, which could potentially pose a risk of being aggressive from a tax perspective (European Council (2017)). Tax authorities within the EU obtain immediate exhaustive information on all potentially tax aggressive transactions at the time they are ready to be used by the taxpayers or to be promoted by the intermediary. Post DAC6, EU tax authorities would obtain information on transactions involving opening bank accounts in countries that do not exchange information under the CRS. Because DAC6 enhances detection risk of holding income and wealth in CRS non-participating countries, we expect a reduction of cross-border deposits in such countries. Since DAC6 prevents individuals to escape into non-reportable financial assets and/or non-reportable financial institutions, we expect an increase in cross-border deposits in EU deposit locations. We summarize in the following hypothesis:

Hypothesis 1. *The introduction of DAC6 leads to an increase [decrease] of cross-border deposits in EU countries [CRS non-participating countries] by EU residents.*

Yet, we expect that DAC6 does not equally impact EU taxpayers given certain key differences detected by Casi et al. (2021) when analyzing its local implementation. First, monetary penalties for misreporting vary substantially across EU member states. Specifically, the enforcement level has been detected to be low across EU member states with the exception of certain countries like Spain and Poland. Spain is the only country that opted for a strong

enforcement as the penalty is based on the value of the incorrectly reported or non-reported transaction or to the related intermediary fee. While Poland charges up to EUR 5 Million for a misreporting by an individual under DAC6, we do not have the deposit data in Poland and therefore only explore the effect in Spain. Hence, we expect that tax evaders decrease the level of income and wealth only in those countries where enforcement under DAC6 is strongly established.

Second, under DAC6, the primary duty to report is on intermediaries. However, even if the cross-border arrangement occurs within the EU territory, the information on a reportable cross-border arrangement needs to be transmitted by the EU-based taxpayer if (i) the intermediary is not located in the EU, (ii) the intermediary is restricted by professional privilege or secrecy rules, or (iii) the arrangements occurred in-house. France, Austria, and Malta extend the legal professional privilege to financial institutions, which means that in these countries the taxpayer is responsible for reporting under DAC6. We, therefore, expect that tax evaders increase the level of income and wealth in those countries with a broad scope for the legal professional privilege. Overall, we summarize our discussion in the following hypothesis:

Hypothesis 2. *The introduction of DAC6 decreases [increases] cross-border deposits of EU residents in EU countries with a strict [more lenient] regulatory environment.*

While cross-country differences in regulatory environments provide individuals with an avoidance opportunity through the reallocation of wealth to favorable environments permissible with the DAC6 reporting requirements, CBI/RBI programs enable individuals to continue the evasion of taxes by escaping the reporting under DAC6 altogether. Such programs offer individuals the possibility to obtain the citizenship or residence rights through local investment or against a flat fee, which allows those individuals to invest through countries offering CBI/RBI programs. Thus, the availability of multiple citizenship and/or multiple residence rights represent a channel to escape the reporting duty under DAC6 by disguising an individual's true residence. We expect cross-border deposits from CBI/RBI residents to increase only outside the EU because DAC6 mandates the reporting of cross-border transactions with an EU nexus, i.e., also those conducted by non-EU residents in the EU. While

tax havens are naturally a place where we would expect cross-border deposits from RBI/CBI programs to flow, recent evidence suggests that individuals hide their wealth also in non-tax haven locations. For example, several luxury properties, including yachts and houses, belonging to sanctioned Russian oligarchs were located in high-tax countries, like Norway or the U.S. (see, Harding (2022), Lambert (2022)). We summarize in:

Hypothesis 3. *The introduction of DAC6 increases cross-border deposits in non-EU countries that originate from CBI/RBI countries.*

4 Research Design

4.1 Data

The data on the cross-border deposits are obtained from the Bank of International Settlements-Locational Banking Statistics (BIS-LBS) database (BIS (2020)). The BIS offers bilateral quarterly data on deposits held by individuals and entities that are not residents of the country where the reporting bank is located. From the BIS-LBS data, we observe cross-border deposits held by the residents of 215 countries (resident countries) in a select list of 31 countries (deposit locations). We retain all country-pairs for the purpose of our main analysis, but we exclude cross-border inter-bank deposits because they are not identified as a channel for tax evasion (Johannesen and Zucman (2014)). Although the data exhibit certain limitation in terms of coverage and granularity,[15] they are extensively used in the literature on cross-border tax evasion because they offer a sound proxy for capturing the reaction of tax evaders to increased scrutiny (e.g. Johannesen and Zucman (2014); Miethe (2020); Casi et al. (2020); Langenmayr and Zyska (2021)).[16] Specifically, the BIS-LBS data enable us to observe, for example, the total amount of deposits French residents own in active banks located in 31 deposit countries, including several well-known tax havens. Moreover, we limit the period of analysis to the first quarter of 2017 until the fourth quarter of 2019. This

[15] See Casi et al. (2020) for an overview of the data limitations.

[16] Other papers studying cross-border tax evasion rely on portfolio investment data in the United States, see e.g. De Simone et al. (2020), Hanlon et al. (2015) or globally, e.g. Heckemeyer and Hemmerich (2020). Yet, using cross-border bank deposits is more appropriate for our analysis given the focus of our study, i.e. financial intermediary.

allows us to exclude possible confounding impacts of the introduction of the CRS and the global pandemic.

For our analysis of the effect of the DAC6 on cross-border deposits owned by EU residents, we limit our sample to residents of all EU and OECD member states to ensure high cross-country comparability across the treatment and the control group. We exclude residents of Malta and Cyprus because these are the only EU member states offering highly risky CBI/RBI programs as defined by OECD (2018) and such programs represent a possible channel to circumvent the reporting duty under DAC6.

Moreover, to ensure that our results are not driven by the reactions of multinational companies, we gather BIS-LBS data on the sectoral decomposition of cross-border deposits.[17] More specifically, we observe the volume of deposits owned by banks, non-banks financial, non-financial corporations, households and general government at the aggregated level. This means that we only observe the total volume of corporate owned deposits in a country, but we don't know the country of residence of the corporation that owns the deposit. For this reason, we cannot directly take advantage of the data, but instead use the sectoral decomposition to infer the composition of cross-border deposits in the deposit country considered in our analysis. The sectoral decomposition is only available for a limited number of deposit locations and we keep those for which deposits owned by non-financial corporations is less than 50% of total non-bank deposits.[18] Our deposit locations include Austria, Australia, Canada, Denmark, France, Italy, Spain, Sweden, Switzerland, South Africa, UK, and the US.

We observe that the data from BIS-LBS has missing values for the deposits in certain quarters for some country pairs. To balance the panel data, we omit all country pair observations with missing values for deposits in any given time period. Table 1 presents the summary statistics for cross-border deposits owned by EU versus OECD residents. During our sample period (from Q1-2017 to Q4-2019), the average bilateral cross-border deposit vol-

[17]Empirical evidence from Edwards et al. (2021) shows that DAC6 increases the effective tax rates of EU multinationals or multinationals with EU subsidiaries suggesting that the new MDR has been successful in reducing tax avoidance.

[18]We run robustness checks where we keep all deposit locations and alternatively where we only keep deposit locations where 1/3 or less of the deposits owned by non-financial corporations. These changes do not affect our inferences and, which suggests that multinationals' reaction to DAC6 does not drive our results.

ume amounts to USD 7 billion. The value of cross-border deposits owned by EU residents (the treatment group) is comparable to the one owned by non-EU OECD residents (the control group) both in terms of average bilateral cross-border deposit with EU countries and non-EU countries. The descriptive statistics support our assumption that non-EU OECD residents are a sound control group for our analysis.[19]

For our analysis of the effect of DAC6 on cross-border deposits owned by CBI/RBI countries, we collect information on CBI/RBI programs from the OECD website.[20] The OECD classify those programs as being high-risk if they offer access to a low income tax rate on financial assets and do not impose any physical presence in the country for a significant amount of time. The list of countries we consider include: United Arab Emirates, Bahamas, Bahrain, Barbados, Cyprus, Dominika, Grenada, Malta, Saint Lucia, Turks and Caicos Islands and Vanuatu.

Our sample extends to all bilateral data available at the BIS. We only exclude residents of EU member states from our control group (we include non-OECD countries as well) as they are directly affected by the DAC6. We still retain residents of Malta and Cyprus, since those two countries offer high-risk CBI/RBI schemes.[21] Moreover, we retain all deposit locations because there is no reason to expect that any detected movement of cross-border deposits in this part of the analysis is driven by multinational companies reacting to DAC6. It is reasonable to expect that any increase in cross-border deposits held by residents of aggressive CBI/RBI countries is exclusively driven by individual incentives to hide the true citizenship/residency to avoid the higher detection probability post DAC6. Table 1 presents the summary statistics for cross-border deposits owned by CBI/RBI versus non-CBI/RBI residents.[22]

[19] In the Appendix, we show the development of cross-border deposits over time owned by EU-residents and non-EU residents.

[20] For more information, see https://www.oecd.org/tax/automatic-exchange/crs-implementation-and-assistance/residence-citizenship-by-investment/: :text=While%20residence%20and%20citizenship%20by,under%20the%20OEC

[21] We test the effect of DAC6 separately for EU and non-EU CBI/RBI residents and find similar results.

[22] In the Appendix, we show the development of cross-border deposits over time owned by CBI/RBI versus non-CBI/RBI residents.

4.2 Methodology

Our analysis is based on both a difference-in-difference estimation and an event study approach. We use the difference in difference design to estimate the average effect of the DAC6 on cross-border deposits held by EU residents. We run regressions of the form:

$$Deposits_{ijt} = \alpha + \beta_2 PostDAC6_t * EUResidents_i + \gamma_{jt} + \theta_{ij} + \epsilon_{ijt}. \quad (1)$$

We use the event studies to explore pre-trends and dynamic effects of the DAC6 on cross-border deposits held by residents of EU versus non-EU countries, which formally reads as:

$$Deposits_{ijt} = \sum_{k=-4}^{4} \alpha_k D_t^k * EUResidents_i + \gamma_{jt} + \theta_{ij} + \epsilon_{ijt} \quad (2)$$

In both specifications, the dependent variable $Deposits_{ijt}$ is the natural logarithm of the volume of cross-border deposits located in country j and owned by a resident of country i at the end of quarter t. $EUResidents_i$ is a dummy taking value one when the resident country is a EU member state. The variable of interest in the difference-in-difference specification is the interaction of $PostDAC6_t$ and $EUResidents_i$. $PostDAC6_t$ is the post-period dummy and it switches to one after DAC6 became effective in June 2018.[23] The variables of interest in the event study are the dummies D_{jt}^k indicating a point in time k periods from the DAC6 treatment and interacted with $EUResidents_i$. As is the standard in the literature for event studies, we omit the indicator for period t-1, which serves as a benchmark. We bin the treatment indicators at the endpoints.[24] We include deposit-country quarter-year fixed effects γ_{jt} to control for common time trends affecting cross-border deposits (e.g. globalization of financial markets and economic shocks), and deposits country-specific demand-side shocks. Ordered country-pair fixed effects θ_{ij} are added to control for all time-invariant country-pair factors (e.g. distance or common language), which might affect the change in cross-border

[23]EU member states had time until December 31 2019 to transpose the directive into national law. Yet, every national law had a retrospective element since all cross-border arrangements advised or in use from June 25, 2018, needed to be reported if fulfilling the characteristics stated under DAC6.

[24]Binning implies here that the indicator t-4 stands for treatment at time t-4 or more periods ago and the indicator t+4 stands for time t+4 or more periods in the future. See Schmidheiny and Siegloch (2019) and Fuest et al. (2018).

deposits as a reaction to DAC6. Our standard errors are cluster-robust, with clustering at the resident country level. The error term is denoted by ϵ_{ijt}.

Similarly, we use a difference-in-difference regression followed by an event study design to estimate the effect of the DAC6 on cross-border deposits owned by CBI/RBI residents in the EU and outside the EU. Specifically, we compare the changes in cross-border deposits held by residents of CBI/RBI countries to the ones held by residents of non-CBI/RBI countries (excluding EU countries) pre and post DAC6 implementation. The regression equations are the same as 1 and 2, but we substitute the treatment variable with $CBIRBI\_Residents_i$, which takes value of one when the resident country i is a CBI/RBI country.

5 Results

5.1 The Effect of DAC6 on EU-owned Deposits: a Cross-Country Analysis

5.1.1 Main Analysis

In this section, we show the results of testing hypotheses 1 and 2. Table 4 illustrates the results for the difference-in-difference (DiD) regression model from equation (1). Columns (1)-(3) refer to the results of testing hypothesis 1, whereas columns (4)-(6) report the results of testing hypothesis 2. Column (7) serves as a contrast to columns (4)-(6) by showing the results for the countries not offering a preferential or stricter regulatory environment.

In column (1) the coefficient on the interaction term is positive and statistically significant suggesting the introduction of DAC6 led to a 11%[25] increase in deposits in the EU by EU residents most likely due to greater disclosure of offshore accounts. In a given quarter-year, the average amount of deposits held by EU residents in our sample of EU countries is USD 1131 billion. Given our estimates, that amount increased by USD 124 billion post-DAC6. Column (2) shows the results for non-EU deposit locations indicating DAC6 did not affect deposits of EU residents located outside the EU as the coefficient on the interaction term is economically small and statistically insignificant. In column (3), we focus exclusively on how

[25]The percentage increase can be calculated as follows: $exp(0.105) - 1$.

DAC6 affects EU residents' U.S. deposits. The reason is that the U.S. is not participating in the CRS, which will make it easier for individuals to evade taxes as information exchange does not happen automatically. If deposits in the U.S. are directly owned by tax evaders, we should observe a decrease in these deposits after the introduction of DAC6. Yet, our results suggest that U.S. deposits of EU residents are not affected by DAC6. One explanation for this result is that tax evaders do not directly own their U.S. deposits, but indirectly through shell companies set up in tax havens. While we do not have sufficient data on tax haven deposits to directly test this channel, we indirectly shed light on this strategy by studying the effect of DAC6 on the use of CBI/RBI programs in the next section.

[*Insert Table 4 here*]

Figure A.2 shows the graphical results from the event study design of equation (2). In both the panels of Figure A.2, the vertical line between $t = -1$ and $t = 0$ indicates the implementation of the directive by the EU. The reference to DAC6 with the vertical line between $t = -1$ and $t = 0$ applies to all other event studies that follow as well. In panel (a), we witness a constant upward trajectory of deposits in EU deposit locations post-treatment surging in the period $t = 2$ and persisting in the remaining periods of the study. Instead, panel (b), depicting the results of non-EU deposit locations, does not illustrate any significant movement of deposits post DAC6.

[*Insert Figure A.2 here*]

In columns (4)-(6) of Table 4, we present the results for testing hypothesis 2 to verify whether the regulatory environment plays a role for deposit relocation to the EU after the introduction of DAC6. Specifically, in column (4), we analyze how deposits located in Spain are affected by the introduction of DAC6, while column (5) shows the same analysis for France. Spain has a comparably stricter enforcement of DAC6 as it imposes a high monetary penalty on non-compliance, whereas France has a comparably weaker enforcement of DAC6 as it offers a legal professional privilege to financial institutions. If stronger enforcement disincentivizes misreporting or non-disclosure, we should observe a lower inflow of deposits into Spain, but a higher inflow of deposits into France. Interestingly, the coefficient on the

interaction term in column (4) is negative (-16%) and significant, which suggests an outflow of deposits from Spain. In contrast, we observe a positive (30%) and significant effect in column (5), implying a strong inflow of deposits to France.

In column (6), we present the combined results for deposits in France and Austria. We perform this additional test to show the effect of DAC6 on legal professional privilege by including a country where the legal professional privilege also extends to financial institutions, although it is granted only under certain conditions. Thus, in Austria, the extent of the privilege is limited in comparison to France. Austria also represents a special case given the long history of bank secrecy, which resulted in the country being considered a tax haven. However, we note that the inclusion of Austria does not change the result and indicates that any form of professional privilege may be used to relocate deposits.

Column (7) presents the results for all other EU locations excluding Spain, France and Austria. We observe a coefficient that is economically of the same magnitude (11%) as compared to the benchmark in column (1). The combination of results suggests that some deposits owned by EU residents in Spain are relocated after DAC6 within the EU, and potentially to France or Austria. Hence, these results lend credence to the fact that deposits are not repatriated to the residence country, but relocated to a country with a more favorable regulatory environment.

[*Insert Figure 3 here*]

Figure 3 shows the event study results for the sub-samples presented in the last five columns of Table 4. Panel (a) of Figure 3 shows for the sub-sample of the U.S. that the effect size is small in magnitude and statistically insignificant in any post-treatment period. Panel (b) and panel (c) of Figure 3 show the event study results for the sub-samples of Spain and France respectively. In both cases, the effect becomes significant with some delay, but remain significant at the end of the post-treatment period. Panel (d) presents the result for the sub-sample of France and Austria, which is very similar to the one in panel (c). Finally, panel (e) illustrates the results for other EU countries with no significant change in the post-treatment period. Though we observe a positive trend in the post-treatment period, it is not significant at the 95% significance level.

5.1.2 Placebo Test

We conduct a placebo test exploiting the introduction of an MDR in three countries prior to DAC6. More specifically, Portugal introduced its MDR in 2008, the UK followed two years later in 2010 and Ireland another year later in 2011.[26] Thus, for the residents of those countries, we do not expect any effect of DAC6. We test our hypothesis by comparing cross-border deposits of residents of Ireland, Portugal and UK to the ones of residents of non-EU countries before and after the implementation of DAC6.

[*Insert Figure 4 here*]

Figure 4 shows the results of the event study design of equation (2) by changing the treatment group that now only includes the deposits of residents from Ireland, Portugal and the UK. We verify the effect of DAC6 on deposits in four different samples of deposit locations, namely Spain and France. In none of the panels the effect on the treatment group is statistically significant. While we can observe a reduction in deposits located in Spain (panel (a)) and an increase in deposits located in France (panel (b)), the results are not statistically significant. The findings, therefore, corroborate that indeed DAC6, instead of other unobservable shocks occurring at the same time, is accountable for the movements in deposits.

5.2 Circumventing the DAC6 Reporting Requirement via CBI/RBI programs

5.2.1 Main Analysis

In this section, we test hypothesis 3 by analyzing how cross-border deposits in non-EU countries that originate from CBI/RBI countries are affected by the implementation of DAC6. CBI/RBI programs allow individuals to escape information transmission to the true country of residence and therefore enable them to continue the evasion of taxes. Because DAC6 mandates the reporting of cross-border transactions with an EU nexus, i.e. also those conducted

[26]For more details, see Portugal Ministry of Finance (2008), UK Ministry of Finance (2004) and Revenue - Irish Tax and Customs (2019), respectively.

by non-EU residents in the EU, we expect cross-border deposits from CBI/RBI residents to increase only outside the EU.

Table 5 presents the results of the DiD regression model similar to equation (1). The difference to the previous analysis is that the treatment group now constitutes residents of countries offering CBI/RBI programs. Importantly, this also applies to the two EU countries offering CBI/RBI programs – Cyprus and Malta – that are included in the treatment group.[27]

[*Insert Table 5 here*]

In column (1), we present the results for the deposits that are situated in EU deposit locations. We conduct this test to verify whether residents from countries offering CBI/RBI programs invested in the EU post DAC6. As expected, the coefficient of the interaction term is negligible and statistically insignificant. Column (2) shows the results for the sub-sample of non-EU deposit locations. The coefficient on the interaction term is positive (30%) and statistically significant, indicating the strong use of these programs post-DAC6 to circumvent the new disclosure rule. In a given quarter-year, the average amount of deposits held by CBI/RBI residents in our sample of non-EU countries is USD 47 billion. Given our coefficient estimates, that amount increased by USD 14 billion post-DAC6. The different effects between EU and non-EU deposits therefore indicate that CBI/RBI programs have not become lucrative in general, but are explained by the implementation of DAC6.

In columns (3), (4) and (5), we present the results by splitting the non-EU deposit locations into non-EU tax haven locations and non-EU non-tax haven locations respectively. We perform this test to verify whether the deposits from CBI/RBI countries were primarily moved to tax havens due to the lower tax rates offered by the tax haven deposit locations. The difference between these two analyses emerges from the unclear role of the U.S. in terms of secrecy. Given that the U.S. is not participating in the CRS, the country could arguably be treated as a haven.[28] However, so far, there is no general consensus around the status of the U.S. as a tax haven.[29] For this reason, we label the U.S. as a non-haven country in

[27] We restrict the control group to non-EU countries (including non-OECD countries as well) because our analysis in the previous section illustrates that deposits owned by EU residents reacted to the introduction of DAC6. Hence, adding these countries to the control group would bias the results.

[28] See, for example, Casi et al. (2020) who highlight the special role of the U.S. in the context of the CRS.

[29] The U.S. is not in the EU black list or the OECD list for non cooperative countries.

column (4) and we exclude the U.S. from the list of non-haven countries in column (5) as an additional test.

When looking at the effect of DAC6 on deposits of CBI/RBI residents, we observe that deposits significantly increase (27%) in tax haven countries, which translates into an approx. USD 7 billion increase considering an average quarter-year cross-border deposit volume of approx. USD 28 billion in tax havens from CBI/RBI residents. Looking at how deposits in non-haven countries are affected by DAC6, we find that the result is sensitive to the inclusion of the U.S. as a haven country. While DAC6 significantly increases (34%) the deposits in non-haven countries when we include the U.S. in the list of non-haven countries (column (4)), this effect becomes statistically insignificant when we drop the U.S. from the sample (column (5)). Though the coefficient and the standard deviation are quite comparable.

The latter result hints at the potentially special role of the U.S. for tax evasion and may explain why EU residents' deposits in the U.S. remain unaffected by the introduction of DAC6 (cf. Table 4, column (3)). Instead of owning deposits directly in the U.S., EU residents may own them indirectly through a shell company (a trust) in a tax haven, such as the Bahamas. This evasion strategy is important to understand the difference between CRS and DAC6. Under CRS, trusts are considered non-reportable institutions. However, under DAC6, any transaction from a EU country to the tax haven, in our example the Bahamas, which is done to circumvent CRS has to be reported, not by the individual itself, but by the intermediary. To circumvent the reporting duty under DAC6, individuals can set up the trust using a CBI/RBI citizenship rights instead of directly from the EU country because information only flows to the stated residence country, which in this case is the CBI/RBI country. The consequence of this strategy is that deposits in tax havens are no longer owned by EU residents, but by residents of CBI/RBI countries. Although we are unable to test whether deposits of EU residents decrease in tax havens due to data availability, our results show that deposits in tax havens owned by residents of CBI/RBI countries significantly increase after DAC6. Although tax havens are the natural place to expect deposits to flow, we also observe an increase in deposits in non-tax havens. This result is in line with recent evidence that rich individuals hide their wealth in the form of tangible assets, such as yachts and houses, in high-tax countries like Norway and the U.S. (see, Harding (2022), Lambert

(2022)). While our results are indirect by nature, they are consistent with a change in the tax evasion strategy induced by DAC6.

[*Insert Figure 5 here*]

Figure 5 shows the graphical results of the event study for the treatment group of CBI/RBI countries in EU and non-EU deposit locations. Panel (a) presents the results for deposits in non-EU deposit locations and shows an immediately significant effect that is constantly increasing in the post-treatment period. Panel (b) presents the results of the deposits in EU countries and indicates that the effect of CBI/RBI programs is insignificant throughout the entire period of the study. This suggests that the residents of CBI/RBI countries avoided the EU deposit locations post-DAC6.

Figure 6 shows the results of the event study design in various sub-samples of the data. In panel (a), we observe a steady increase in deposits in non-EU tax haven locations which becomes significant in the final period. Panel (b) shows an immediately significant increase in deposits in non-EU non-tax haven locations that remains significant for most of the post-treatment periods. Panel (c) presents the results for the sub-sample of deposits in non-EU non-tax haven locations excluding the U.S. and shows a very similar picture as panel (b) with the only difference that the effect becomes statistically insignificant in the last period.[30]

6 Robustness Checks

In this section, we briefly discuss the tests we conduct to check the robustness of our main findings. First, we conduct a split sample analysis to rule out that our main findings are driven by the control group. We test the changes in cross-border deposits on the sub-sample of EU residents and non-EU residents separately. Figure A.1 in the appendix presents the results for a time trend test of cross-border deposits in different EU locations. When considering the effect of DAC6 in different EU location together and separately as well as

[30]In the appendix, figure A.10 shows the event study results for the deposits owned by CBI/RBI residents. Overall, the results from this additional test show that there is a strong affinity for the CBI/RBI programs post DAC6 whether the country is situated in the EU or outside. One possible explanation is that tax evaders might perceive no risk of detection if the transactions are reported to such countries and not their true country of residence.

outside the EU, the figure shows that the control group is unaffected by the introduction of DAC6. Figure A.4 in the appendix confirms this robustness also for our analysis on CBI/RBI countries.

Second, we examine the reliance of our identification on the fixed effects we select. Specifically, we modify the fixed effects structure of each main result of our analysis. In figure A.5, A.5 and A.6, we alternatively include only country-pair fixed effects, only deposit country-time fixed effects and no fixed effects. Including or excluding fixed effects does not affect our results substantially. The necessity to control for deposit country time variant characteristics (or for general time trends) is limited given the selection of a short sample period that ensures that no major economic shocks affect cross-border deposits. The necessity to control for time invariant characteristics across and within country-pairs is also restricted given the accurate selection of the control and treated group in terms of comparability.

Third, in our main test we restrict the sample to the period from the first quarter of 2017 to the last quarter of 2019 in order to exclude possible confounding impacts of the introduction of FATCA and the CRS in 2010-2016 as well as the global pandemic in 2020. Nevertheless, in the appendix, we test how our results change if we extend our sample period from the first quarter of 2016 to the last quarter of 2020. In figure A.8, we show that the effect of DAC6 on cross-border deposits in Spain and France continues to hold over the whole sample period. In figure A.9, results suggest that residents of CBI/RBI countries increase cross-border deposits in tax havens immediately after DAC6 is introduced, although the effect diminishes in the last quarters of 2020. Instead the increase in cross-border deposits in non-tax havens outside the EU persists throughout the sample period.

7 Conclusions

This paper studies the effect of the MDR introduced by the EU under the sixth amendment to the directive on administrative cooperation, the so-called DAC6, which came into effect in June 2018. By making intermediaries liable to report a comprehensive set of information on aggressive tax structures, the directive adds a new dimension to the disclosure of cross-border financial activity. In the first part of the study, using data on cross-border deposits, we find

that the reporting of cross-border deposits from EU residents in EU deposit locations has considerably increased, with no effect of DAC6 on non-EU deposit locations. However, this result neglects important cross-country differences within the EU. While DAC6 had a negative effect on deposit growth in countries with a stronger enforcement, deposits increased in countries with a weaker enforcement. These results suggest that individuals partially circumvented DAC6 disclosure requirement by relocating deposits to weak enforcement countries that offer professional legal privileges for financial institutions.

In the second part of the study, we investigate the effect of CBI/RBI schemes and their usage as methods of regulatory arbitrage against DAC6. We show that cross-border deposits of residents of CBI/RBI countries in the EU were unaffected by DAC6 demonstrating that pre-DAC6 such schemes were not widely used as method to escape the AEOI. Yet, CBI/RBI country residents sharply increased their deposits in non-EU locations providing evidence that CBI/RBI schemes can be used to escape the disclosure requirement under DAC6.

Overall, our study contributes substantially to the current international debate on increasing regulation of tax advisory service. A key finding is that strong enforcement is an essential element to increased information collection and exchange on cross-border transactions and to ensure a disclosure reaction from tax evaders. Moreover, we provide novel evidence on the regulatory arbitrage offered by the existence of risky CBI/RBI programs.

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Figures and Tables

Table 2: Summary Statistics

Deposit in	All Residents			EU Residents		non-EU residents	
Variables	Obs	Mean	SD	Obs	Mean	Obs	Mean
Cross-Border Deposits	5,436	7,063	40,027	3,396	6,531	2,040	8,248
Of which:							
In the EU	3,276	8,064	45,415	2,004	6,730	1,272	10,103
Outside the EU	2,160	5,544	30,013	1,392	5,747	768	5,175

Notes: The table presents summary sample statistics on bilateral cross-border deposits in millions USD. Data from 2017:Q1 to 2019:Q4. Deposits are from EU and OECD residents in all reporting countries. Deposits are further split based on the deposit location (in the EU and outside the EU). The data originates from the BIS Locational Banking Statistics - Table A6

Table 3: Summary Statistics

Deposit in	All Residents			CBI/RBI Residents		non-CBI/RBI residents	
Variables	Obs	Mean	SD	Obs	Mean	Obs	Mean
Cross-Border Deposits	39,096	1,080	15,237	2,508	517	36,588	1,119
Of which:							
In the EU	18,756	1,130	41,630	1,176	482	17,580	1,174
Outside the EU	20,340	1,034	12,386	1,332	548	19,008	1,068

Notes: The table presents summary sample statistics on bilateral cross-border deposits in millions USD. Data from 2017:Q1 to 2019:Q4. Deposits are from non-EU residents as well as from residents of CBI/RBI countries in all reporting countries. The deposits of residents of Malta and Cyprus (both are CBI/RBI as well as EU countries) are also included when calculating the statistics. Deposits are further split based on the deposit location (in the EU and outside the EU). The data originates from the BIS Locational Banking Statistics - Table A6

Table 4: The Effect of DAC6 on EU-owned Deposits

VARIABLES	Cross-Border Deposits						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample	Within EU	Outside EU	US	Spain	France	France &Austria	Other EU
PostDAC6 * EU Residents	0.105**	-0.021	-0.058	-0.179*	0.265**	0.248***	0.105*
	(0.049)	(0.070)	(0.075)	(0.097)	(0.102)	(0.083)	(0.060)
Constant	5.378***	5.185***	7.075***	5.145***	6.713***	5.674***	5.281***
	(0.017)	(0.026)	(0.029)	(0.035)	(0.036)	(0.029)	(0.021)
Observations	3,276	2160	480	492	492	984	1,800
R-squared	0.990	0.988	0.991	0.989	0.983	0.986	0.992
Country-Pair FE	YES	YES	YES	YES	YES	YES	YES
Deposit-Quarter-Year	YES	YES	NO	NO	NO	YES	YES
Quarter-Year	NO	NO	YES	YES	YES	NO	NO
Clustering	Resident Country						

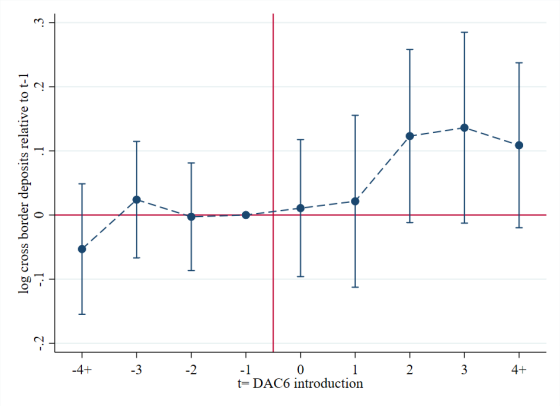
Notes: The table reports the main DiD estimates. The dependent variable is the log of cross-border deposits held by residents of country i in banks in deposit country j at the end of quarter q. The sample period is 2017:Q1 to 2019:Q4 and the sample is restricted to residents of EU and OECD countries. EU residents indicator takes value of one if the deposits are owned by a resident of a EU country and zero otherwise. In Column 1, deposit locations consists exclusively of EU countries, while in Column 2, deposit locations are exclusively non-EU countries. In Column 3, deposit location is the US, while in Column 4, 5, 6, and 7 the deposit location is Spain, France, France and Austria, and Denmark, UK, Italy and Sweden respectively. In column 1, 2, 6 and 7, ordered country-pair and deposit country x quarter-year fixed effects are included. In column 3, 4 and 5 ordered country-pair and quarter-year fixed effects are included. Standard errors are clustered at residence country level and are reported in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: The Effect of DAC 6 on Deposits owned by CBI and RBI residents

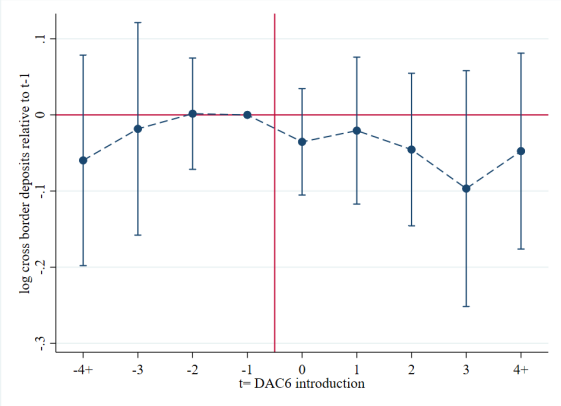
VARIABLES	Cross-Border Deposits				
	(1)	(2)	(3)	(4)	(5)
Sample	In EU	Outside EU	Non-EU TH	Non-EU Non-TH (incl US)	Non-EU Non-TH (excl. US)
Post DAC6 * RBICBI Residents	-0.029	0.266**	0.242**	0.293*	0.283
	(0.085)	(0.111)	(0.109)	(0.158)	(0.177)
Constant	2.163***	2.149***	2.444***	1.831***	1.186***
	(0.003)	(0.004)	(0.004)	(0.006)	(0.006)
Observations	18,756	20,340	10,560	9,780	8,472
R-squared	0.975	0.968	0.975	0.961	0.947
Country-Pair FE	YES	YES	YES	YES	YES
Deposit-Quarter-Year	YES	YES	YES	YES	YES
Clustering	Resident Country				

Notes: The table reports the main DiD estimates. The dependent variable is the log of cross-border deposits held by residents of country i in banks in deposit country j at the end of quarter q. The sample period is 2017:Q1 to 2019:Q4 and the sample excludes residents of EU member states, with the exception of those from Malta and Cyprus. In Column 1, deposit locations consist exclusively of EU countries while in Column 2 of non-EU countries. In column 3, Chile, Guernsey, Hong Kong, Isle of Man, Jersey, Macau, Switzerland are included. In column 4, Australia, Brazil, Canada, Korea, Mexico, Philippines, South Africa, Taiwan, and the United States are included. In Column 5, all the countries in Column 4 are included except the US. Ordered country-pair and deposit country x quarter-year fixed effects are included. Standard errors are clustered at residence country level and are reported in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Figure 2: Dynamic Effect of DAC 6 on EU-owned Deposits in and outside EU



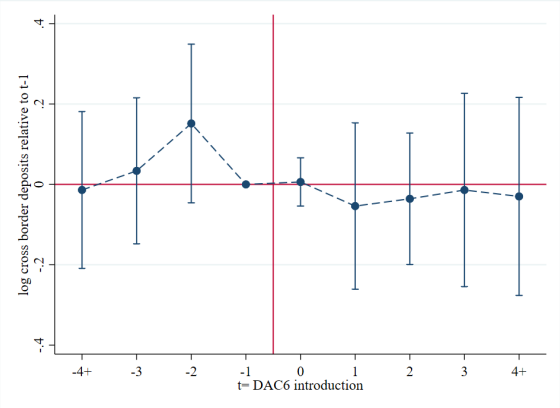
(a) Deposits within the EU



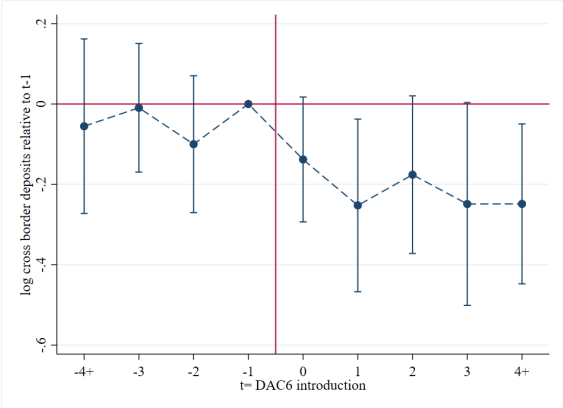
(b) Deposits outside the EU

Notes: The figure shows the coefficients, each of which marks the change in cross-border deposits held within the EU (panel (a)) and outside the EU (panel (b)) around the DAC6 event date (in event time). The sample is restricted to residents of EU and OECD countries. The outcome variable, the log of cross-border deposits, is estimated via event-study regression equation (2). Ordered country-pair and deposit country x quarter-year fixed effects are included in both panels. Standard errors are clustered at residence country level.

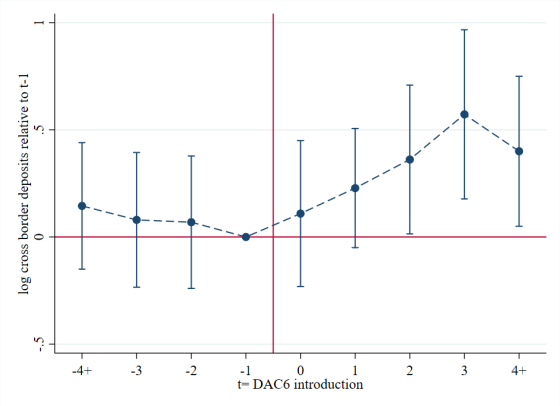
Figure 3: Dynamic Effect of DAC 6 on EU-owned Deposits - Cross-Country Analysis



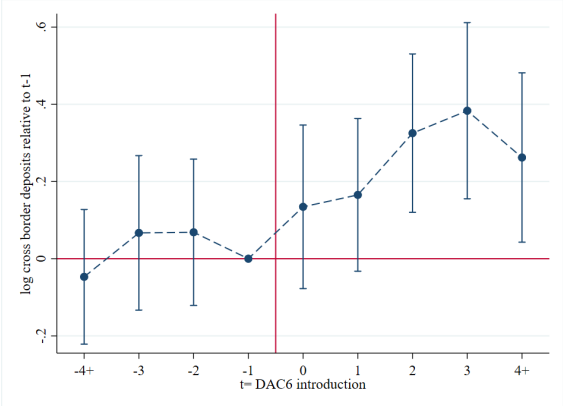
(a) Deposits in US



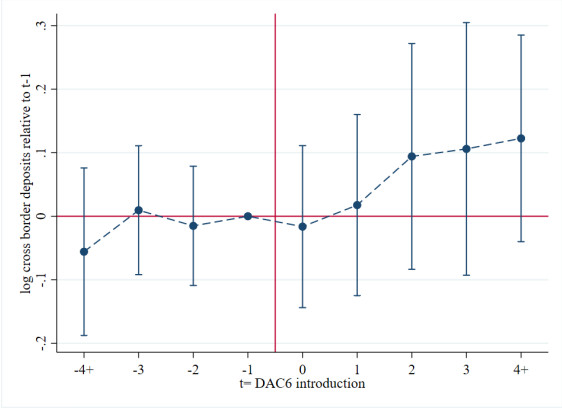
(b) Deposits in Spain



(c) Deposits in France



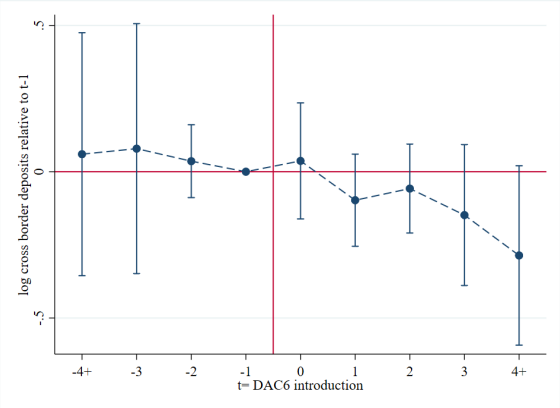
(d) Deposits in France and Austria



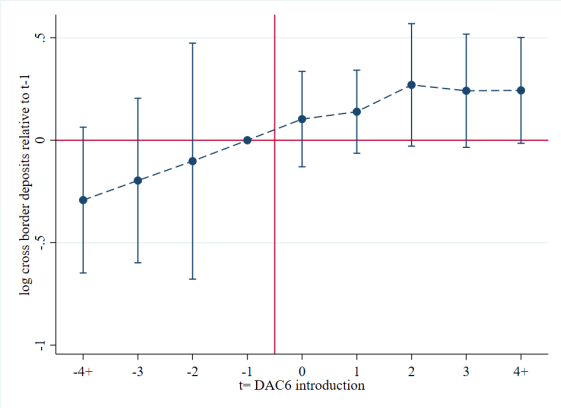
(e) Deposits in Other EU Countries

Notes: The figure replicates figure 4 panel (a) but with different deposit locations. The figure shows the coefficients, each of which marks the change in cross-border deposits held in the United States (panel (a)), in Spain (panel (b)), in France (panel (c)), in France and Austria (panel (d)) and Denmark, UK, Italy and Sweden (panel (e)) around the DAC6 event date (in event time). Ordered country-pair and quarter-year fixed effects are included in panel (a), (b) and (c). Ordered country-pair and deposit country quarter-year fixed effects are included in panel (d) and (e). Standard errors are clustered at residence country level.

Figure 4: Dynamic Effect of DAC 6 on EU-owned Deposits - Placebo



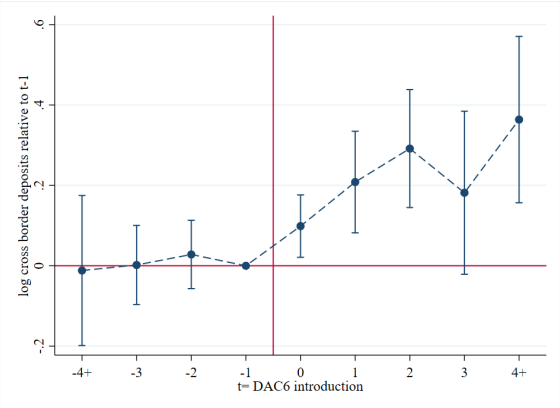
(a) Deposits in Spain



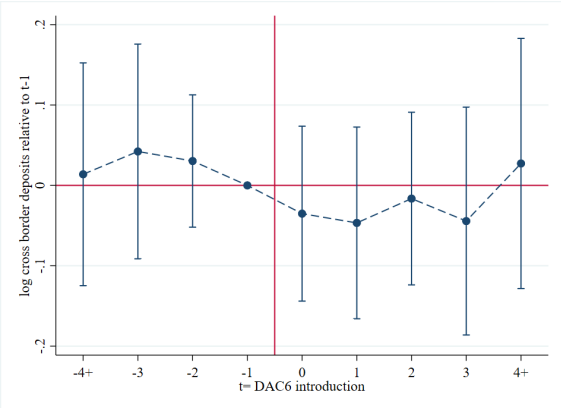
(b) Deposits in France

Notes: The figure shows the coefficients, each of which marks the change in cross-border deposits held in Spain (panel (a)), in France (panel (b)) around the DAC6 event date (in event time). The sample is restricted to residents in Ireland, Portugal and UK and OECD countries which are not EU member states. The outcome variable, the log of cross-border deposits, is estimated via event-study regression equation (2). The dependent variable is the log of cross-border deposits. Ordered country-pair and quarter-year fixed effects are included in both panels. Standard errors are clustered at residence country level.

Figure 5: Dynamic Effect of DAC 6 on Deposits owned by CBI and RBI residents



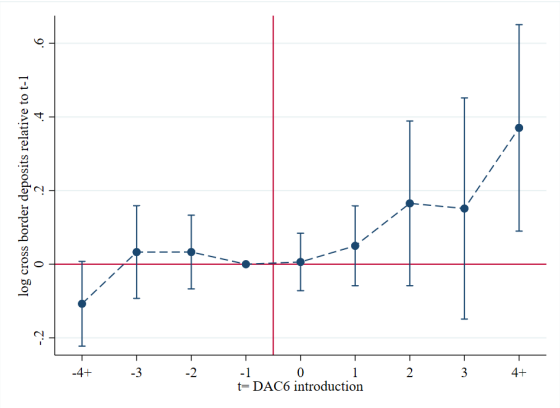
(a) Deposits outside the EU



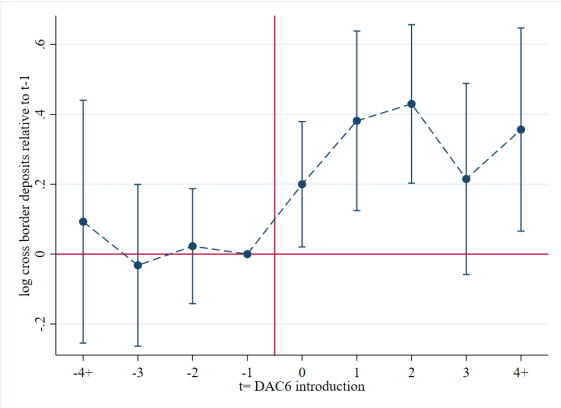
(b) Deposits in EU

Notes: The figure shows the coefficients, each of which marks the change in cross-border deposits held in the EU (panel (a)), outside the EU (panel (b)). The sample excludes residents of EU member states, with the exception of those from Malta and Cyprus. The outcome variable, the log of cross-border deposits, is estimated via event-study regression equation (2). Ordered country-pair and deposit country x quarter-year fixed effects are included in all panels. Standard errors are clustered at residence country level.

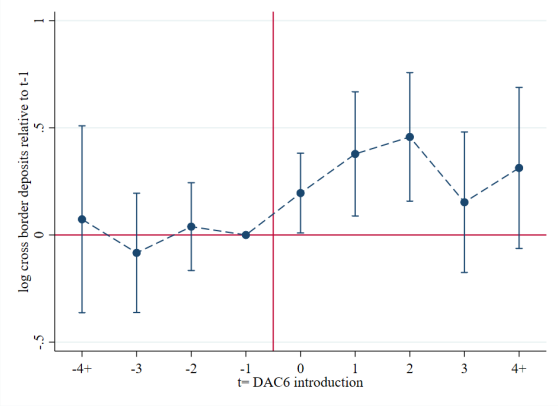
Figure 6: Dynamic Effect of DAC 6 on Deposits owned by CBI and RBI residents



(a) Deposits in non EU Tax Havens



(b) Deposits in non EU non Tax Havens



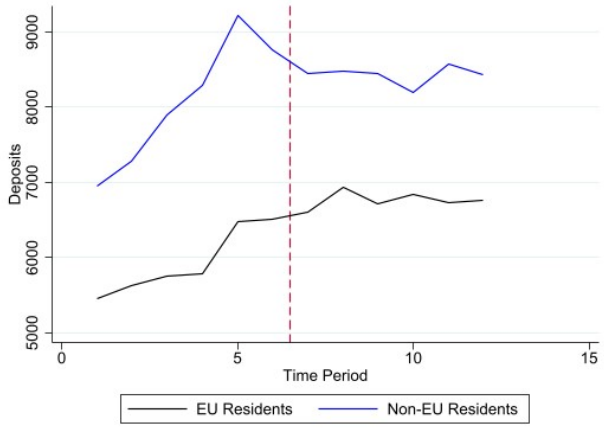
(c) Deposits in non EU non Tax Havens excl US

Notes: The figure replicates figure 7 panel (a) but with different deposit locations. The figure shows the coefficients, each of which marks the change in cross-border deposits held in Chile, Guernsey, Hong Kong, Isle of Man, Jersey, Macau, Switzerland (panel (a)), in Australia, Brazil, Canada, Korea, Mexico, Philippines, South Africa, Taiwan, and the United States (panel (b)), and in Australia, Brazil, Canada, Korea, Mexico, Philippines, South Africa, and Taiwan (panel (c)) around the DAC6 event date (in event time). The sample excludes residents of EU member states, with the exception of those from Malta and Cyprus. Ordered country-pair and deposit country x quarter-year fixed effects are included in all panels. Standard errors are clustered at residence country level.

Appendix

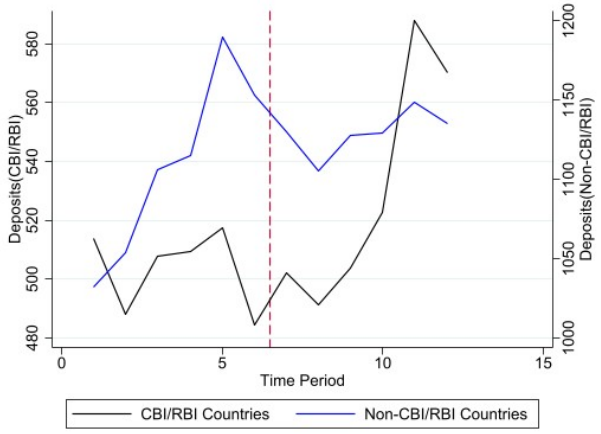
A1 Additional Descriptives - Cross-Border Deposits over Time

Figure A.1: Time Trends - EU and OECD owned Deposits



Notes: The graph shows the evolution of cross-border deposits owned by EU residents (black line) and non-EU OECD residents (blue line). The data originates from the BIS Locational Banking Statistics - Table A6. The red dashed line represents DAC6 introduction.

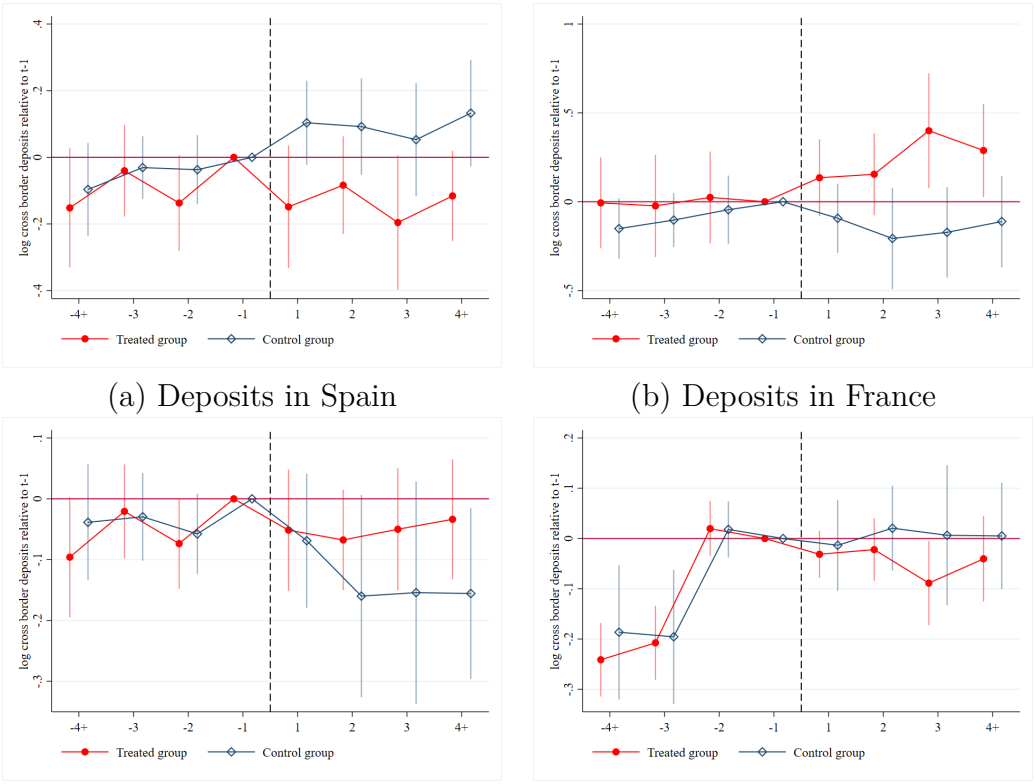
Figure A.2: Time Trends - CBI and RBI owned Deposits



Notes: The graph shows the evolution of cross-border deposits owned by CBI/RBI residents (black line) and non-CBI/RBI residents (blue line). The data originates from the BIS Locational Banking Statistics - Table A6. The red dashed line represents DAC6 introduction. The non-CBI/RBI countries include all the countries except EU countries.

A2 Robustness Checks - Split Tests

Figure A.3: Dynamic Effect of DAC 6 on EU-owned Deposits - Split Test



(a) Deposits in Spain

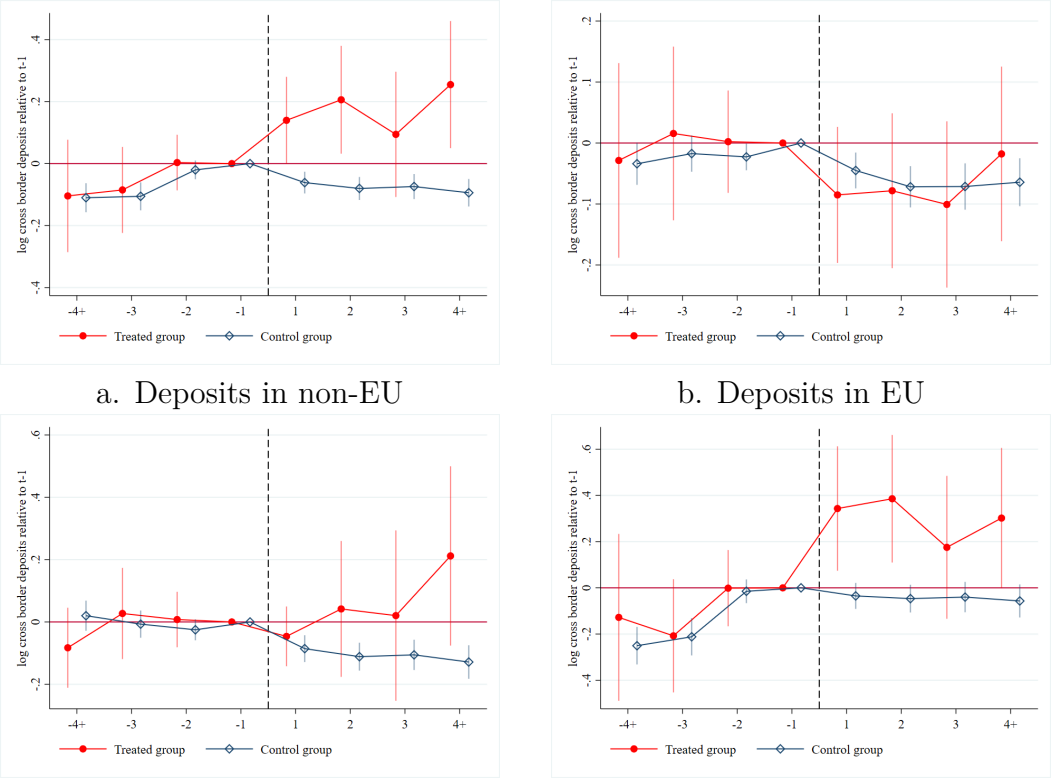
(b) Deposits in France

(c) Deposits in other EU

(d) Deposits outside EU

Notes: The figure replicates figure 5 panels (b), (c), (d) and (e) and figure 4 panel (b). The figure shows the coefficients, each of which marks the change in cross-border deposits held by residents of EU (red) and non-EU (blue) in Spain (panel (a)), in France (panel (b)), in Denmark, UK, Italy and Sweden (panel (c)) and in Australia, Canada, Switzerland, United States and South Africa (panel (d)) around the DAC6 event date (in event time).

Figure A.4: Dynamic Effect of DAC 6 on deposits owned by CBI and RBI residents - Split Test



a. Deposits in non-EU

b. Deposits in EU

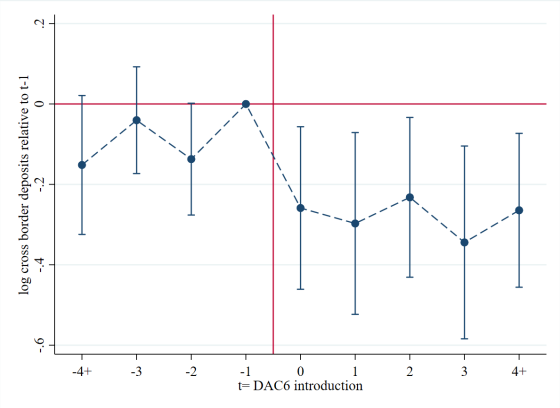
c. Deposits in non-EU tax haven

d. Deposits in non-EU non-Tax Havens

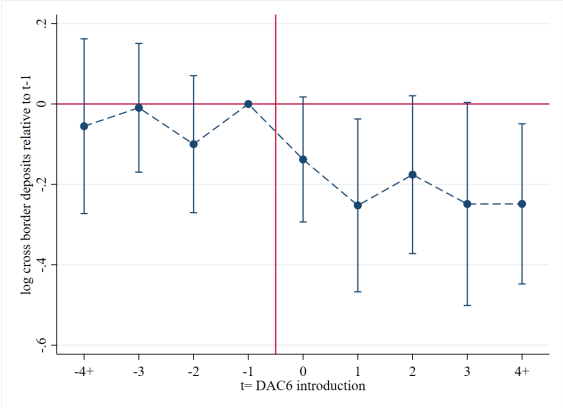
Notes: The figure replicates figure 7 panels (a) and (b) and figure 8 panel (a) (b) and (c). The figure shows the coefficients, each of which marks the change in cross-border deposits held by residents of CBI/RBI countries (red) and non-CBI/RBI countries (blue) in all non-EU deposit locations (panel (a)), in all EU deposit locations (panel (b)), in Chile, Guernsey, Hong Kong, Isle of Man, Jersey, Macau, Switzerland (panel (c)), in Australia, Brazil, Canada, Korea, Mexico, Philippines, South Africa, Taiwan, and the United States (panel (d)) around the DAC6 event date (in event time).

A3 Robustness Checks - Different Fixed Effects Structure

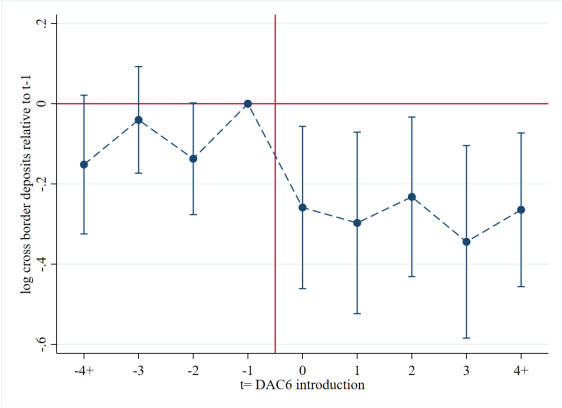
Figure A.5: Dynamic Effect of DAC 6 on Deposits in Spain owned by EU residents



(a) Only Country-Pair Fixed Effects



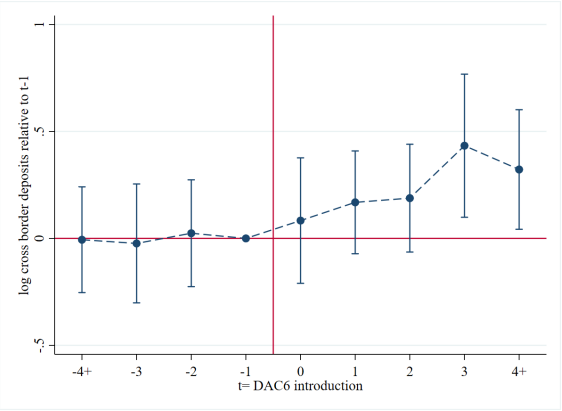
(b) Only Quarter-Year Fixed Effects



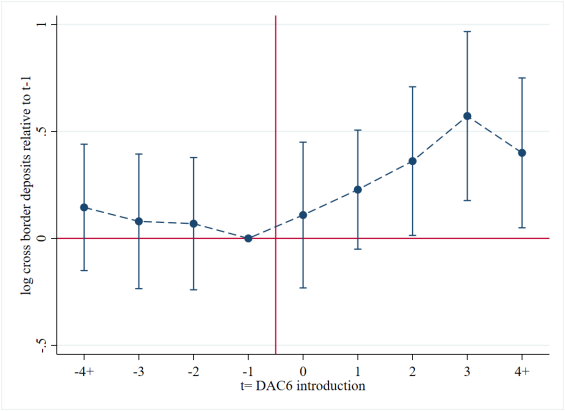
(c) No Fixed Effects

Notes: The figure replicates figure 5 panel (b) but with different fixed effects. Ordered country-pair fixed effects are included in panel (a), quarter-year fixed effects are included in panel (b), no fixed effect is included in panel (c). Standard errors are clustered at residence country level.

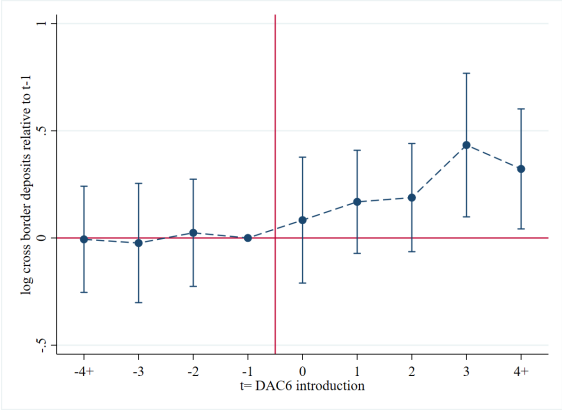
Figure A.6: Dynamic Effect of DAC 6 on Deposits in France owned by EU residents



(a) Only Country-Pair Fixed Effects



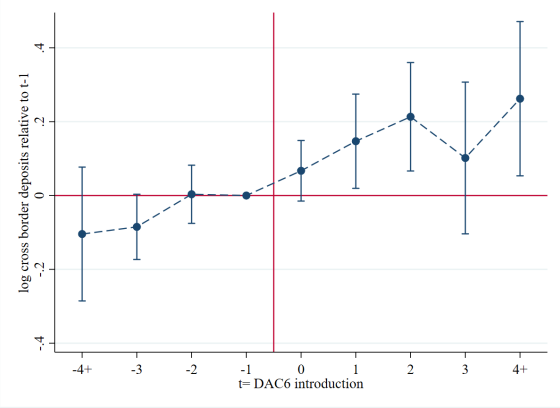
(b) Only Quarter-Year Fixed Effects



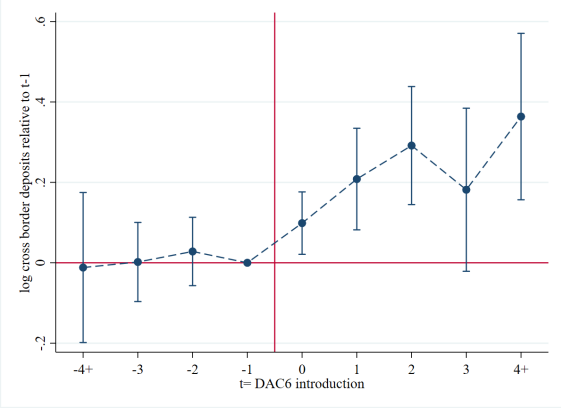
(c) No Fixed Effects

Notes: The figure replicates figure 5 panel (c) but with different fixed effects. Ordered country-pair fixed effects are included in panel (a), quarter-year fixed effects are included in panel (b), no fixed effect is included in panel (c).

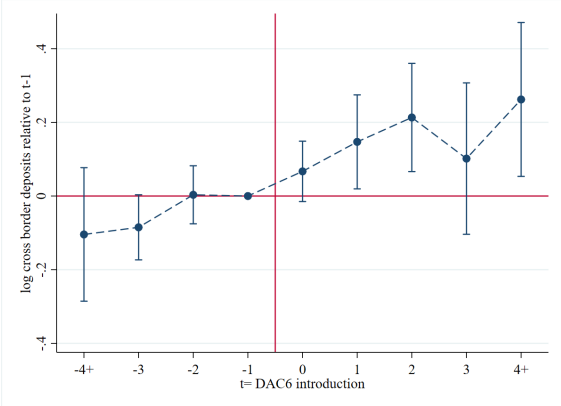
Figure A.7: Dynamic Effect of DAC 6 on Deposits owned by CBI and RBI residents



(a) Only Country-Pair Fixed Effects



(b) Only Deposit Country-Quarter-Year Fixed Effects

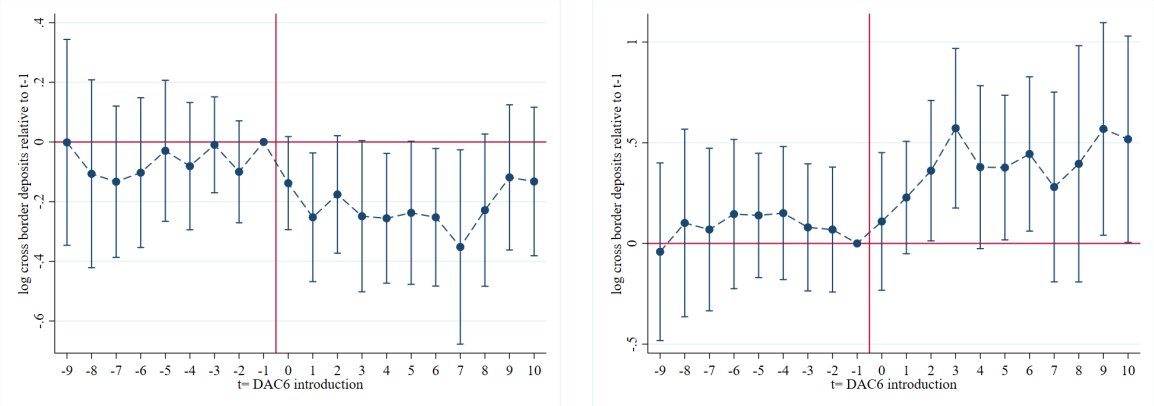


(c) No Fixed Effects

Notes: The figure replicates figure 7 panel (a) and (b) but with different fixed effects. Ordered country-pair fixed effects are included in panel (a), deposit country quarter-year fixed effects are included in panel (b), no fixed effect is included in panel (c). Standard errors are clustered at residence country level.

A4 Robustness Checks - Long Term Effect

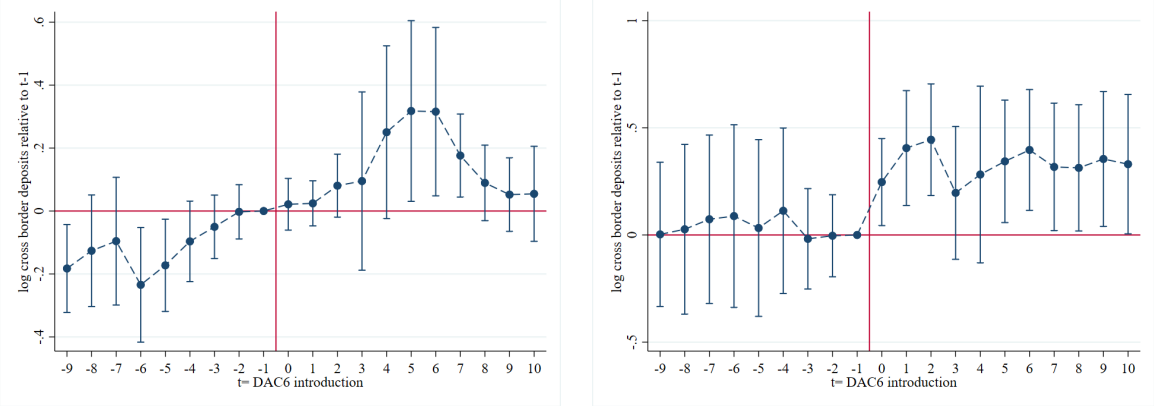
Figure A.8: Dynamic Effect of DAC 6 on EU-owned Foreign Deposits - Long Run



a. Deposits in Spain b. Deposits in France

Notes: The figure replicates figure 5 panel (b) and (c). A longer period of time is considered from Q1-2016 to Q4-2020.

Figure A.9: Dynamic Effect of DAC 6 on Deposits owned by CBI and RBI residents - Long Run

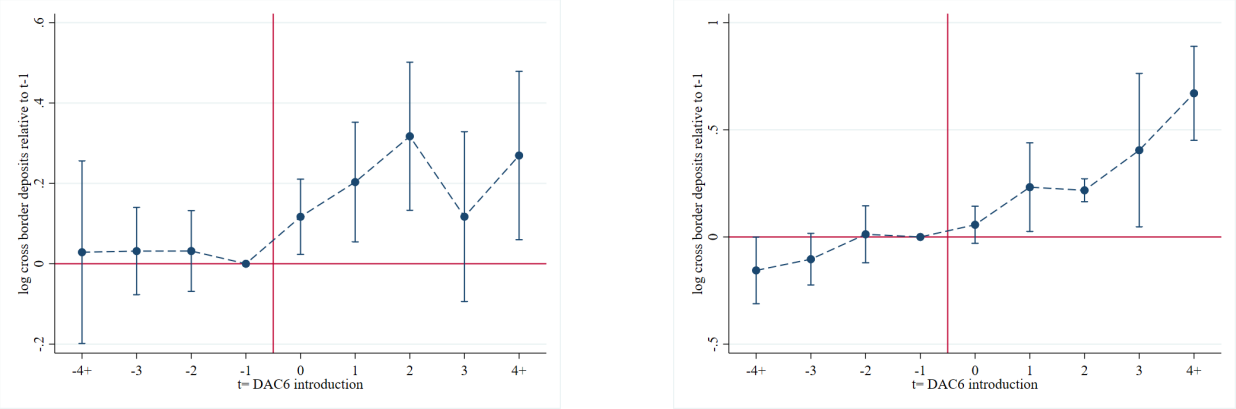


a. Deposits in non EU Tax Havens b. Deposits in non EU Non Tax Havens

Notes: The figure replicates figure 9 panel A and B. A longer period of time is considered from Q1-2016 to Q4-2020.

A5 Additional Tests - The Use of CBI/RBI Programs in and outside the EU

Figure A.10: Dynamic Effect of DAC 6 on Deposits owned by CBI and RBI residents - Country Split



(a) Excluding residents of Malta and Cyprus (b) Including only residents of Malta and Cyprus

Notes: The figure shows the coefficients, each of which marks the change in cross-border deposits held outside the EU excluding those held by residents of Malta and Cyprus (panel (a)), including only those held by residents of Malta and Cyprus (panel (b)) around the DAC6 event date (in event time). The sample includes residents of Malta and Cyprus and residents of countries that are not in the EU and have no CBI or RBI programs. The outcome variable, the log of cross-border deposits, is estimated via event-study regression equation (2). Ordered country-pair and deposit country x quarter-year fixed effects are included in both panels. Standard errors are clustered at residence country level.