

Avoiding Transparency through Offshore Real Estate: Evidence from the United Kingdom*

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Abstract

The 2014 Automatic Exchange of Information (AEOI) represents the most comprehensive global effort to combat tax evasion by enabling cross-border information exchange on financial assets. We examine how this policy shifted offshore investment behavior. While the AEOI mandates reporting of financial assets, it excludes real estate holdings. Using administrative data on UK real estate purchases by foreign companies, we show that offshore users substituted financial assets for real estate in response to the new transparency regime. Our findings suggest that real estate assets now account for a growing share of offshore portfolios, partly due to their exclusion from the AEOI.

Keywords: Tax Enforcement, Real Estate, Hidden Wealth

JEL Codes: D31, R30, H26

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1 Introduction

Tax havens have long undermined governments’ ability to enforce taxes on cross-border investments. Estimates indicate that 8% of household financial wealth is held in tax havens (Zucman, 2013), with a substantial portion historically evading taxation (Alstadsæter, Johannesen and Zucman, 2019; Guyton et al., 2021; Londoño Vélez and Ávila-Mahecha, 2021; Londoño Vélez and Tortarolo, 2025). In the 2010s, however, a major policy initiative to tackle tax evasion was implemented on a global scale: the Automatic Exchange of Information. Under this policy, tax authorities started to exchange automatically information about financial accounts of non-residents. This model of international third-party reporting greatly reduces the possibility for taxpayers to hide wealth and income abroad: it is designed to bring an end to bank secrecy. More than 100 countries, including major tax havens, participate to these agreements today, making it the most comprehensive policy ever enacted to enhance tax transparency. One major loophole of the Automatic Exchange of Information, however, is that it only covers financial assets. This creates new incentives for evaders to invest their offshore holdings in non-financial assets, in order to avoid the reporting requirements introduced by AEoI.

In this paper, we study the extent to which investors responded to the new transparency policy by substituting their offshore investments toward real estate. We do so by analyzing one of the most popular cross-border property markets globally, the United Kingdom. To identify the effects of AEoI on real estate investments, we draw on unique administrative data on UK properties held by foreign companies: the Overseas Companies Ownership Dataset (OCOD). Crucially, about 95% of these companies are located in secrecy jurisdictions, enabling their ultimate owners to remain anonymous. We manage to pierce this veil of secrecy by combining property ownership data with extensive beneficial ownership information from the Offshore Leaks (including the Panama Papers, the Pandora Papers and other leaks) and various corporate registries.

Our identification strategy exploits variation in both the timing of countries’ commitment to the transparency policy and investors’ preferential use of specific tax havens. In 2013 and 2014, a group of sixty-seven countries, the “early adopters”, committed to implement the Automatic Exchange of Information in the near future. Analysis of over one million shell companies from the Offshore Leaks and other corporate registries reveals that investors from these early-adopting countries tend to locate their companies in some tax havens more than others. For instance, European countries, which committed to AEoI in 2013/2014, frequently incorporate companies in Luxembourg but rarely in the Seychelles or Cayman Islands. We exploit this heterogeneity to identify the tax havens most affected by the Automatic Exchange of Information, constructing an “AEoI exposure” measure for each jurisdiction based on the proportion of company owners residing in early-adopting countries. Importantly, this exposure measure is independent of whether the tax haven itself committed to the AEoI: what matters is the exposure of the shell companies’ *owners*, who are expected to respond to the policy regardless of where their company is incorporated.

Using a difference-in-differences design with AEoI exposure as a continuous treatment variable, we find that higher

exposure leads to significantly higher real estate investment after 2013. The difference in quarterly purchases between fully exposed havens and those with zero exposure averages approximately £136 million in the post-AEoI period. Scaled to the full set of havens, our estimates imply that in the three and a half years following the endorsement of the AEoI, an additional £27 billion (USD 43 billion) was invested in the UK real estate market through shell companies held by residents of early-adopting countries. This surge persists through 2017, the end of our baseline specification period. As expected, extending the sample period reduces the investment gap between highly exposed and other jurisdictions, as new countries commit to the AEoI over time. The surge primarily involves high-value properties above £2 million, consistent with recent evidence that offshore users typically come from the top of the income and wealth distribution (e.g. [Alstadsæter, Johannesen and Zucman, 2019](#); [Guyton et al., 2021](#)).

Our results are robust to a variety of checks. A first series of tests examines the AEoI exposure measure. We find a significant rebalancing response under three alternative measures: one built from cross-border bank deposit data from the Bank for International Settlements (BIS), one from alternative corporate ownership data from Orbis and one that imputes the exposure of havens absent from the Leaks using a gravity model. These alternative measures yield rebalancing responses comparable to or even larger than our baseline. A second series addresses a potentially serious confounder: UK tax reforms targeting foreign property ownership during our sample period. These reforms applied almost exclusively to residential properties, leaving commercial properties largely unaffected. Studying the two segments separately, we find that offshore investment increased in both after the introduction of the AEoI, indicating that the surge is not driven by domestic tax changes.

Unlike many financial assets, real estate wealth is generally easier for tax authorities to identify and monitor: offshore property owners in the UK, for example, are subject to a range of taxes that cannot be evaded. This specificity of real estate as an offshore asset has two direct implications. First, the portfolio rebalancing we document comes at a fiscal cost for tax evaders. The tax saved by escaping the AEoI is much more likely to outweigh this cost for investors from high-tax countries than for those from low-tax countries; a response by the latter thus reveals a value placed on secrecy for purposes other than tax evasion, including money laundering, sanctions evasion, or other financial crimes ([Transparency International UK, 2015](#); [Collin, Hollenbach and Szakonyi, 2022](#)). Although we cannot precisely quantify the relative importance of these motives, offshore investors from high-tax countries systematically favor properties with lower tax burdens, which is a clear indication of tax evasion's role in the rebalancing response we identify. Second, this specificity also has implications for the distribution of tax revenue. Relative to a benchmark with full compliance, the evasion response we document does not amount to a pure loss of revenue for governments: it partly shifts revenue from the investor's country of residence to the country where the property is located. Consequently, the response to the AEoI documented in this paper has a distinct impact on (i) overall tax revenue and (ii) the distribution of these revenues across countries, compared to other types of evasion responses.

Beyond a pure transfer of tax revenue, the reallocation of investors' offshore portfolios is also likely to have real

economic effects. First, offshore investors have been shown to significantly affect local house prices (Johannesen, Miethe and Weishaar, 2022), and the surge in UK property purchases may thus impact local populations through increased housing costs. Second, in response to the AEoI, offshore investors modify the composition of their portfolios, potentially resulting in a less efficient allocation if returns on real estate are lower than on financial assets—although there may also be substantial gains from diversification across asset classes and from international diversification of housing holdings (Jordà et al., 2019).

What do our results tell us about the effectiveness of the AEoI? The UK is unlikely to be the only destination of financial wealth shifted into real estate and other property markets have plausibly absorbed similar flows. To gauge the global magnitude of the reallocation, we scale our UK estimate to the world, assuming the UK captured the same share of the global response as its share of the cross-border real estate market, about 20% (Tranio, 2017). Under this assumption, around USD 213 billion was invested in real estate worldwide in response to the early adopters' commitment to the policy. How large is this response? Existing studies have estimated how much financial wealth left tax havens once the AEoI was announced. Under our preferred estimate (O'Reilly, Ramirez and Stemmer, 2021), which studies the same policy event as we do, real estate absorbed about 42% of the financial assets that left tax havens. This share that falls to 15% under the largest estimates in the literature (Menkhoff and Miethe, 2019; Casi, Spengel and Stage, 2020; Beer, Coelho and Leduc, 2019). Real estate thus emerges as a critical blind spot in international tax transparency and the exclusion of non-financial assets from the reporting requirements appears as an important design flaw of the AEoI. The magnitude of the rebalancing also carries implications for the measurement of top wealth: given that offshore wealth is heavily concentrated among the wealthiest households (Alstadsæter, Johannesen and Zucman, 2019; Guyton et al., 2021; Londoño Vélez and Ávila-Mahecha, 2021; Lejour et al., 2023), existing estimates may significantly understate the real estate component of top portfolios.

Our paper contributes to the growing literature on tax transparency policies and their impact (see Slemrod (2019) for an overview). Since the early 2000s, efforts to fight offshore tax evasion have intensified through various financial transparency initiatives. Early policies, including the European Savings Directive and Information on Request treaties, achieved limited success due to their narrow scope and the ease with which they could be circumvented (Johannesen, 2014; Johannesen and Zucman, 2014; Menkhoff and Miethe, 2019; Martínez-Toledano and Roussille, 2023). A nascent literature has examined newer automatic exchange initiatives, both the U.S. Foreign Account Tax Compliance Act (FATCA) and its multilateral counterpart, the Common Reporting Standard (CRS) (De Simone, Lester and Markle, 2020; Casi, Spengel and Stage, 2020; O'Reilly, Ramirez and Stemmer, 2021; Alstadsæter et al., 2023; Langenmayr and Zyska, 2023; Bomare and Collin, 2024; Boas et al., 2024; Baselgia, 2026; Davoine et al., 2026; Johannesen, Larsen and Riedel, 2026). However, with the exception of De Simone, Lester and Markle (2020), who find indirect evidence that American taxpayers may have responded to FATCA by acquiring properties or artworks, previous studies have largely overlooked the role of real estate in the responses to the AEoI. Our main contribution is to provide the first

direct evidence of investors shifting their offshore portfolios toward real estate in response to the Automatic Exchange of Information.

Second, while not its primary contribution, our paper also provides new evidence on the size and the nature of the offshore real estate market in the UK. Evidence on offshore real estate remains scarce, with a handful of studies covering Norway (Alstadsæter and Økland, 2022), Dubai (Alstadsæter et al., 2025), Singapore (Agarwal, Chia and Sing, 2020) and France (Morel and Uri, 2021). As one of the main destinations for cross-border real estate investment globally, the UK is a key market and existing studies only cover specific segments, focusing on corporate ownership and mostly residential properties (Bomare, 2019; Johannesen, Miethe and Weishaar, 2022; Bourne, Ingianni and McKenzie, 2022). The scope of our study is more comprehensive, covering both residential and commercial property, and both direct ownership by individuals and indirect ownership through corporate structures. Drawing on multiple data sources, we estimate that around USD 260 billion worth of UK property was held from abroad in 2018. Together with our main analysis, these results speak to a growing literature on offshore wealth and its distribution (Zucman, 2013; Pellegrini, Sanelli and Tosti, 2016; Henry, 2012; Alstadsæter, Johannesen and Zucman, 2018, 2019; Guyton et al., 2021; Londoño Vélez and Ávila-Mahecha, 2021; Lejour et al., 2023; Johannesen et al., 2020, 2024), by highlighting the significance of real estate in offshore portfolios.

Finally, we also contribute to a literature studying the drivers and the effects of foreign investment in real estate markets (e.g. Badarinza and Ramadorai, 2018; Sá, 2016; Cvijanovic and Spaenjers, 2020; Hilber and Vermeulen, 2016). A set of studies focuses in particular on the effects of transparency measures on real estate markets (Collin, Hollenbach and Szakonyi, 2022; Johannesen, Miethe and Weishaar, 2022; Collin, Hollenbach and Szakonyi, 2026; Agarwal, Chia and Sing, 2020). Our contribution to this literature is to study the effect of a global tax enforcement shock, which partially alleviates concerns about external validity that often arise when examining shocks limited to a single country. We also make a methodological contribution by developing a novel approach to trace capital flows back to their ultimate source. This methodology reveals that a substantial portion of apparently foreign investment in UK real estate originates from domestic individuals, an approach that can be applied to other contexts where investor identities are obscured.

The paper proceeds as follows. Section 2 presents the institutional context of the Automatic Exchange of Information and the trade-offs faced by taxpayers. Section 3 describes our data and provides descriptive evidence on the UK offshore real estate market. Section 4 examines how corporate real estate investments responded to the AEoI. Section 5 presents robustness checks of our main results, while section 6 explores key mechanisms. Section 7 discusses the implications of the results for the overall effectiveness of the AEoI. Section 8 concludes.

2 Institutional Context and Its Consequences for Offshore Users

2.1 The Automatic Exchange of Information

In September 2013, G20 leaders endorsed the automatic exchange of information (AEOI) as the new global standard for cross-border information exchange on financial accounts. Under this standard, financial institutions in participating countries are required to collect detailed information about their non-resident clients, including their identity, country of residence, account balances and financial capital income. This information is then shared annually and automatically with the tax authorities of the account holder’s country of residence.¹ In 2014, the OECD established the operational framework for the implementation of the AEOI: the Common Reporting Standard (CRS). The CRS defines the scope of the information collected, the participating financial institutions and the reporting mechanisms. By mid-2014, sixty-seven countries—including most major tax havens—had committed to the CRS, making it the most comprehensive global initiative ever implemented to enhance tax transparency. A key strength of the CRS is that financial institutions must identify the ultimate owners of the assets they hold, so that in principle a taxpayer cannot escape reporting by inserting additional layers of ownership between themselves and their assets.

The CRS, however, has several limitations. First, while more than 100 jurisdictions have agreed to exchange information under the CRS today, its coverage remains incomplete, with some jurisdictions still outside the framework. Second, taxpayers can exploit legal loopholes to avoid reporting, such as using citizenship-by-investment programs to obscure their tax residence (Langenmayr and Zyska, 2023). Most critically, the CRS only applies to financial assets, leaving non-financial assets, including real estate, entirely outside its scope. This exclusion represents a significant loophole, as it allows tax evaders to restructure their offshore portfolios by shifting wealth from financial assets, which are subject to reporting, into real estate, which is not.

In this paper, we study the extent to which taxpayers responded to the transparency policy by investing in the UK real estate market through foreign shell companies.² This form of ownership affords the owner a degree of anonymity that direct ownership does not: directly held property is more readily observable by domestic tax authorities and hence more exposed to older, less comprehensive forms of information exchange that predate the CRS.³ Ownership through a shell company avoids this exposure and, importantly, shares in a shell company that mostly holds real estate are not themselves reportable under the CRS.⁴ This form of real estate ownership therefore leaves particularly little trace under

¹For example, if a taxpayer from country A holds an account in country B, the tax authorities in country B will automatically and annually report details of the account and its owner to the tax authorities in country A.

²The European Parliament defines shell companies as companies with no real economic activity in the state of registration (Kiendl Krišto and Thirion, 2018). In this paper, we operationalize this definition by considering all companies incorporated in a tax haven, as defined by Menkhoff and Miethe (2019), as shell companies.

³Before the CRS, direct ownership of real estate could already be subject to information exchange: exchange of information on request and, for property within the EU, automatic exchange between member states under Directive 2011/16/EU (DAC1). These mechanisms are narrower than the CRS and, in the case of DAC1, apply only to the extent the relevant ownership information is collected and available, which is much less likely when the property is held through a foreign entity.

⁴In CRS terms, shares in a company are an “equity interest” and whether that interest is reportable depends on how the company is classified. If the company is an Investment Entity, the equity interest is itself a “Financial Account” and is directly reportable; if it is a Passive Non-Financial

the CRS, which is precisely what makes it an attractive way to hold wealth beyond the reach of the policy.⁵

2.2 Conceptual Framework

In response to the CRS, a taxpayer holding undeclared offshore financial wealth can declare it and pay the tax due, or restructure their holdings toward real estate to remain hidden. The aim of this section is to clarify the main economic and tax trade-offs involved in order to shed light on the relevant mechanisms.

Taxation of the two assets. Financial and real estate assets are taxed differently. Financial assets are taxed on a residence basis: the tax is owed in the investor’s home country, which is precisely what offshore structures aim at evading. Real estate is taxed both at source—through property and transaction taxes levied where the property is located, regardless of the owner’s residence or concealment—and on a residence basis, through the owner’s home-country taxation of the asset. Appendix Section G describes in detail the taxes applying to real estate in the UK and how they changed during the period covered by this paper. We therefore write the effective tax rate on real estate as $\tau = \tau^S + \tau_j^R$, separating the unavoidable source-based component from the evadable residence-based one, and denote by $\tilde{\tau}_j$ the effective tax rate on undeclared financial assets for an investor of type j : the statutory rate scaled by the probability of detection, plus expected penalties (Allingham and Sandmo, 1972).

Before the CRS, detection is low, so the residence-based taxes on both assets go largely unpaid: $\tilde{\tau}_j$ and τ_j^R are near zero. Real estate nonetheless bears its source-based tax τ^S in full. Hidden financial wealth thus enjoys a tax advantage equal to τ^S , which explains why offshore wealth may primarily consist of financial assets when tax transparency is low. The CRS raises the detection probability on financial assets, pushing $\tilde{\tau}_j$ toward its statutory level, while leaving real estate taxed as before.

Tax motive versus secrecy motive. Households’ portfolio allocation between real estate and financial assets has been shown to respond to changes in relative returns (Martínez-Toledano, 2022; Le Guern Herry, 2024), and a tax-motivated investor therefore shifts into real estate once it offers the higher after-tax return,

$$r(1 - \tau^S) > \tilde{r}(1 - \tilde{\tau}_j), \quad (1)$$

where r and $\tilde{r}$ are the pre-tax returns on real estate and financial assets. This condition is likely to fail before the CRS, when hidden financial assets are effectively untaxed, and can hold once the CRS raises $\tilde{\tau}_j$ sufficiently. Investors

Entity (NFE), the equity interest is not a Financial Account and the shares are not reportable in themselves. A company that mostly holds real estate falls in this second category: an Investment Entity is defined by investing in or managing financial assets, whereas such a company merely holds real estate. The CRS can still reach these structures through any financial account the shell maintains at an institution in a CRS jurisdiction, which is a Reportable Account.

⁵Rental income can nonetheless leave an indirect trace: if collected in an account at a financial institution in a CRS jurisdiction, it is added to that account’s reported balance. However, it is not directly reported as income, as the CRS reports only include information on account balances as of December 31 of a given year and financial income, not property-related income.

may, however, hold hidden wealth for reasons other than tax evasion, such as money laundering (Harrington, 2016; Collin, Hollenbach and Szakonyi, 2022), and shift into real estate for the concealment it provides rather than for its after-tax return. Condition (1) helps distinguish the two motives: rebalancing is worthwhile on tax grounds only once the effective tax on financial assets exceeds the threshold $\tilde{\tau}_j^* = 1 - \frac{r}{\tilde{r}}(1 - \tau^S)$, which depends only on relative pre-tax returns and the source-based taxation of real estate. A response concentrated among investors whose tax exposure plausibly exceeds this threshold—those facing high statutory rates and credible enforcement at home—points to tax evasion as the driver. A response by investors whose tax exposure falls short of it cannot be explained by after-tax returns and instead reveals a value placed on concealment in itself. The level of the threshold depends on relative returns. If the two assets earn comparable risk-adjusted returns over the long run (Jordà et al., 2019), $r/\tilde{r}$ is close to one and the threshold is approximately τ^S : a tax-motivated shift requires the CRS to raise the effective tax on financial assets by at least the source-based tax the investor picks up by moving into property. If financial assets earn a higher pre-tax return ($\tilde{r} > r$), the threshold rises above τ^S , since the tax saving must also compensate for the forgone return; responses by investors with modest tax exposure then become correspondingly stronger evidence of a concealment motive.⁶ Section 6 uses this logic, examining the tax consequences of investing in UK real estate over the CRS period to discuss which motive is more likely to dominate.

Transfer of tax revenue and efficiency costs In welfare terms, the implications of the rebalancing depend on whether it is simply a transfer or whether it introduces distortions and consumes real resources (Chetty, 2009). Transfers occur along two dimensions. To the extent that investors continue to escape residence-based tax, the government of residence forgoes revenue. At the same time, investors moving into property pick up the source-based tax τ^S , whose revenue accrues to the government where the property is located: unless taxpayers buy real estate in their own country while hiding their identity, the rebalancing thus shifts revenue from the residence country to the property country. Section 6.2 examines how much of the response is attributable to British investors, for whom the two coincide.

Beyond these transfers, the shift may be distortionary through two channels. First, if financial assets are the better investment ($\tilde{r} > r$), the CRS pushes investors into an inferior asset to remain hidden, and the induced allocation is inefficient. The size of this cost is difficult to assess. On the one hand, the long-run evidence suggests it need not be large: although equities have earned somewhat higher returns than real estate, they have done so at the cost of higher volatility, and housing returns exhibit low correlation with equity returns and across countries, implying potential gains from diversification—including from internationally diversified housing portfolios (Jordà et al., 2019). Moreover, the

⁶Although wealthy investors accumulate wealth largely through capital gains on the assets they hold (Fagereng et al., 2025), the total return on real estate also depends on whether the property is rented out. A rented property yields rental income in addition to capital gains, but the rent leaves a trace in the context of the CRS. Indeed, if it is collected in an account at a financial institution in a participating jurisdiction, it raises the account's reported balance. However, the trace is faint: the CRS reports only include information on account balances as of December 31 of a given year and financial income, not property-related income. Moreover, in our setting, capital gains alone are likely to represent a sizeable return: house prices in the United Kingdom rose steadily over the period, particularly in London where house prices have increased by more than 30% on average between 2015 and 2025 according to the Land Registry house price index.

pre-CRS concentration in financial assets, itself sustained by the evasion advantage τ^S , was not obviously efficient to begin with. On the other hand, these are aggregate long-run averages; realized returns vary considerably across periods and market segments, and whether the shift leads to a less efficient allocation for a given investor depends on their overall portfolio, including onshore holdings we do not observe. Overall, the allocative cost of the rebalancing is difficult to sign at the individual level, though the aggregate evidence suggests it is not necessarily large. However, distortions may also operate through housing markets: concentrated demand in the high-end segments that attract offshore buyers (Johannesen, Miethe and Weishaar, 2022) can raise prices and crowd out other purchasers, while the effect on rents depends on use, as acquired properties add to rental supply if let but withdraw housing from the market if left vacant.

3 Data and Descriptive Statistics

The United Kingdom, and particularly London, is a popular destination for global real estate investments (Sá, 2016; Badarinza and Ramadorai, 2018). This section outlines the data sources we use to study the offshore real estate market in the UK, i.e. UK real estate held from abroad and/or through a foreign vehicle, and provide key descriptive statistics on its scale and on the geographic distribution of ownership.

3.1 Foreign Corporate Ownership of Properties in the UK

Our primary data source is the Overseas Companies Ownership Dataset (OCOD), managed by the Land Registry. It provides comprehensive snapshots of real estate ownership by foreign companies in England and Wales. The dataset includes information on the date and location of purchases, the recorded price (available in almost 30% of the case), tenure classification (Freehold or Leasehold) and detailed information about the corporate buyer, including its name, country of incorporation and registered address. The first available snapshot dates back to November 2015 and includes information on all properties that have been bought and kept by their owner until that date.⁷ Snapshots are updated quarterly until November 2017, transitioning to monthly updates thereafter. We focus on transactions made from 2000 until the end of 2020.

We use a processing algorithm relying on machine learning techniques developed by Bourne, Ingianni and McKenzie (2022) to parse the property addresses and classify them between residential and commercial properties. The outcome is a dataset structured at the property level. To recover price information when missing, we make use of an-

⁷This means that we have exhaustive data on transactions made by foreign companies after November 2015, but observe a transaction made before this date only if the property has not been sold since. In Appendix Table A.1, we compare holding periods across groups of buyers to assess whether this trimming affects the observed composition of buyers before 2015. Holding periods are broadly similar across groups; if anything, properties held through Jersey and the British Virgin Islands, the two most important tax havens, are somewhat more likely to be sold within the first year of purchase (Panel B). To the extent that such buyers turn over their properties faster, their pre-November-2015 purchases are less likely to be part of our sample. This implies that we might somewhat underestimate ownership from tax havens before that date.

other dataset managed by the Land Registry, the Price Paid Data (PPD).⁸ The PPD provides details on the majority of residential and some non-residential property purchases in the UK since 1995, including price, address and transaction date. After standardizing address information in both datasets, we match the OCOD to the PPD using the property’s address and postcode. The matching process allows us to recover the price of an additional 24% of the transactions.⁹ Exploiting the properties’ characteristics, we predict the price of the remaining 47% of the purchases using the sample of transactions where the price is available. We provide details of our extensive processing work in Appendix section B.

Our final sample consists of 103,924 transactions conducted over the 2000-2020 period. Table 1 displays the characteristics of the properties bought by foreign companies. Around 75% of the properties are residential, while 25% are commercial properties. Overall, the average value of UK properties purchased through foreign companies is high. The average price in our sample is approximately £1.2 million and reaches £1.7 million when restricting to prices directly observed in the OCOD and the PPD.¹⁰ The average price of residential properties is around £955,000, meaning that residential properties purchased through foreign entities are transacted at prices more than four times higher than the average residential property price in the UK over the same period (£230,000 according to the PPD). As shown in Appendix Figure A.1, the price distribution of offshore residential purchases has a markedly thicker right tail than that of the UK market as a whole: offshore buyers concentrate in the most expensive segments. Unsurprisingly, London is particularly attractive to these investors: we find that almost 50% of UK properties purchased by foreign companies are located in the Greater London area. As a way to visualize the geographical concentration of these transactions, Figure A.2 displays the relative share of offshore buyers by local authority (England and Wales) and ward (London) over the 2000-2019 period. Purchases through foreign companies are concentrated in Greater London, in the Liverpool-Manchester area and the Birmingham area. Zooming into London, we observe a relatively higher share of offshore buyers in the Center and the North-West, which corresponds to the most expensive parts of the city.

3.2 Beneficial Ownership Data

Corporate ownership datasets. To obtain more information on the buyers of UK properties, we use several files leaked from offshore service providers and national corporate registries between 2013 and 2021. These files include the Offshore Leaks, the Bahamas Leaks, the Paradise Papers, the Panama Papers and the Pandora Papers. Originating

⁸The price information may be missing for several reasons. First, HM Land Registry only started collecting price data for transactions involving non-private buyers from October 2013 (for some transactions happening before that date, the price information can be non-missing if the applications were lodged for registration to the Land Registry after 2013). Second, companies often purchase portfolios of properties and if the price paid for each property is not specified in the transaction document (Form TR5: Transfer of a portfolio of titles (whole or part)), the Land Registry excludes the price information from the register.

⁹The matching rate is not 100% because the PPD excludes a substantial share of properties present in the OCOD, including most non-residential properties. Moreover, addresses have different structures in both datasets and we adopt a conservative matching technique to avoid false positives.

¹⁰This is partly due to our conservative price prediction method which is likely to provide a lower bound for the true price (the transaction prices we use for the prediction are winsorized at the 95% level, see Appendix Section B.). In the main analysis, we show that our results are robust to the price inference, as they closely align with results obtained when restricting the estimation sample to transactions with non-missing price information.

from law firms, offshore financial institutions or national corporate registries, these documents provide data on the beneficial owners of thousands of shell companies created or managed for their clients. The International Consortium of Investigative Journalists analyzed the files and published the names, addresses and countries of residence of the entities’ owners. Additionally, we draw on data leaked in 2019 from the Cayman National Bank and Trust in the Isle of Man (CNBIOM), a financial institution that managed accounts for approximately 1,400 companies over our period of analysis.¹¹ Finally, we incorporate data from the OpenLux database, an investigative project led by the French newspaper *Le Monde*. OpenLux offers a snapshot of the Luxembourg beneficial ownership registry as of December 2019 and provides information on 260,000 Luxembourg companies and over 70,000 company owners. Throughout this paper, we collectively refer to these datasets—comprising both the leaked files and the OpenLux database—as the beneficial ownership data or the Leaks data. We use these datasets to gain insight on the countries of residence of UK property owners who invest through offshore entities. Appendix section C explains in detail how we process these data for the analysis.

Table A.3 provides a summary of the characteristics of the beneficial ownership data sources. The table includes information on the time coverage of the data, and the number of companies and unique beneficial owners observed. In total, we have an insight into the structure of more than one million companies and the holdings of more than 500,000 identified beneficial owners.¹² The three most comprehensive data sources are the Panama Papers, the Paradise Papers and OpenLux.

The foreign ownership datasets display patterns in the use of tax havens across regions (see Appendix Table A.6 for the tax havens list we use throughout the paper).¹³ Figure 1 shows where company owners in the main tax havens appearing in the leaks data come from, by world region.¹⁴ The largest share of individuals creating shell companies originates from the Asia-Pacific region (27%), followed by Western Europe (22%) and North America along with other English-speaking countries (12%). Notably, the United Kingdom alone accounts for 9% of all shell company owners. The graph highlights the heterogeneity of tax haven use, by world region. While jurisdictions like the British Virgins Islands, the Bahamas or Malta attract investors from a large scope of regions, some tax havens tend to be used predominantly by investors from specific areas of the world. For example, companies incorporated in Malaysia, Samoa and Singapore are predominantly owned by investors from the Asia-Pacific region, while the Isle of Man, Jersey and Guernsey are particularly used by investors from the United Kingdom. Similarly, Luxembourg is especially

¹¹The complete CNBIOM data have been analyzed in Collin (2021), to offer a comprehensive picture of offshore users in the Isle of Man. Bomare and Collin (2024) use this dataset to analyze behavioral responses of offshore clients to the implementation of the CRS.

¹²Note that we do not have information about the beneficial owners of all the companies listed in the leaks and the OpenLux data; sometimes we only have access to the identity of the administrators, the directors, or no information at all about their ownership/management.

¹³There is no consensus on which countries should be considered as tax havens. We use the list of tax havens of Menkhoff and Miethe (2019), which is obtained by combining the lists of Gravelle (2015) and Johannesen and Zucman (2014), leading to 58 countries being classified as tax havens.

¹⁴We group countries by region of the world. We draw on the groups defined in Badarizna and Ramadorai (2018), who study foreign real estate investments in London, and we create finer sub-groups to reflect the importance of the countries we identify as buying UK properties in section F. We therefore create 11 groups: the United Kingdom alone, the Arabian Peninsula, the rest of the Middle East, North America and the English world (including South Africa), Africa (excluding South Africa), Asia-Pacific, Western Europe (excluding the UK), South Asia, Southern Europe, Eastern Europe and South and Central America.

avored by Western Europeans and the Cook Islands by individuals from North American and English speaking countries. Geographical proximity and historical and cultural links thus seem to play an important role in explaining these heterogeneous tax haven preferences (Laffitte, 2026).

Register of Overseas Entities. The Register of Overseas Entities (ROE) was established following the enactment of a UK law in Spring 2022, requiring all foreign entities holding UK properties to disclose the identities of their beneficial owners. The data is managed and published by Companies House, which also oversees the UK companies register. For beneficial owners who are individuals, the register includes their name, date of birth, nationality and correspondence address. For corporate beneficial owners, the register provides the company’s name, address and country of incorporation. As of August 2023, around 29,000 companies have registered some information with Companies House, covering more than 140,000 properties. Despite the fact that the ROE still has major gaps that allow the real property owners to remain hidden (Advani et al., 2023), this data source helps us trace the ultimate ownership of a significant share of UK properties in the Land Registry dataset.¹⁵ We also use this data source in order to infer company owners’ most probable “true” residence country when the observed country of residence is a tax haven (see Appendix Section C.3).

3.3 The UK Offshore Real Estate Market in 2018

This subsection highlights several key facts about offshore real estate in the UK. An extensive analysis, along with the underlying methodology, is provided in Appendix section F.

Scale. We estimate that in 2018, foreign companies owned in total almost USD 170 billion in UK real estate. Adding UK real estate held directly by foreign *individuals*, about USD 260 billion worth of UK property was held from abroad in 2018.¹⁶ In London alone, property held from abroad represents around USD 180 billion. This is larger than in Paris (USD 50 billion), Dubai (USD 100 billion) or Singapore (USD 80 billion) (Alstadsæter et al., 2025).

Immediate ownership. Who owns offshore real estate in the UK? Figure 2 shows estimates of the value of the stock of real estate held by the top 20 countries of immediate ownership. Several clear patterns emerge. First, ownership is very concentrated. The top 5 countries own about 50% of total foreign-owned real estate wealth, the top 10 countries own 65% and the top 20 own more than 80%. Second, the seven most important countries are usually classified as tax

¹⁵Some of the most important gaps of the ROE include the 25% threshold to qualify as a beneficial owner, which makes it easy to divide ownership between e.g. several members of a family to avoid reporting; and the fact that trust structures information is not being made available to the public. Moreover, a substantial portion of foreign companies did not comply with their reporting obligations: about 10% of properties held in the UK in August 2023 are owned by companies that failed to register their beneficial owners. Advani et al. (2023) estimate that because of both design flaws and non-compliance, essential beneficial ownership information for more than 71% of properties owned by foreign companies are still missing or publicly unavailable. In addition, the ROE does not provide a random picture of the offshore world. It only includes companies owning properties in the UK and it is not a random event; registration of foreign entities has been discussed in the UK for several years and individuals who wished to avoid being reported on could have taken steps to restructure their offshore affairs. As such, we do not use the ROE to gather information on the heterogeneous use of tax havens by country.

¹⁶The characteristics of the 90,000 properties held by foreign entities in 2018 are comparable to those of the average property purchased over 2000–2020 (see Table 1).

havens. In total, more than 74% of foreign investment in UK real estate goes through tax havens when including both properties purchased by individuals and corporations. As Appendix Figure F.2b shows, owners are even more concentrated in a few countries when focusing on corporate ownership: the top 5 countries own almost 80% of indirectly held UK real estate in 2018, the concentration being even more pronounced among tax havens. The four most important buyers also have particularly strong links with the UK: the Channel Islands (Jersey and Guernsey), the British Virgin Islands and the Isle of Man.

Ultimate ownership. If the majority of foreign-owned UK real estate is held from tax havens, it is unlikely that the ultimate beneficial owners of these properties are effectively residents of these countries. To identify the beneficial owners of companies purchasing UK properties, we rely on information from the leaks and the additional beneficial ownership data. The whole method is explained in detail in Appendix Section F.3. Combining corporate and direct ownership, Figure 3 presents our estimates of the distribution of UK real estate ownership, by ultimate owners' country of residence. Appendix figures F.2c and F.2d show these estimates separately for directly and indirectly held properties.

Residents of the United Kingdom constitute by far the main group of buyers through offshore companies. This may be due to tax planning, as buying the shares of a company holding a property rather than the property directly allows one to avoid the property transaction tax. Although recent reforms have reduced the tax advantages of corporate ownership compared to direct ownership, these benefits remained significant until 2017, especially for commercial properties.¹⁷ The large number of UK residents among shell companies' owners is also consistent with many UK tax evaders circumventing the AEOI by investing anonymously in domestic properties. We discuss in section 6 the extent of the reallocation response to the AEOI that can be attributed to UK investors. Beyond UK residents, investors from the Middle East, particularly the United Arab Emirates, account for a large share of ultimate owners. Other significant investor groups include residents of the United States, South Africa, both of which have strong historical ties to the UK, and China. South East Asian countries also make up a large share of real estate owners, which is driven by their importance in directly held properties.

4 The Effect of the AEOI on the Demand for Offshore Real Estate

4.1 Empirical Strategy

The early adopting countries. A total of sixty-seven countries committed to the AEOI in 2013 or 2014. This process began with the G20's endorsement of automatic information exchange in September 2013, followed by a March 2014 joint statement by 44 jurisdictions and the OECD's May 2014 Declaration. We refer to the 2014 commitments to the

¹⁷See Appendix Section G for a detailed discussion on the tax implications of purchasing properties through foreign companies versus directly for UK residents.

CRS as the “Joint Announcement” in the rest of the paper. We call the 67 countries the “early-adopters”, as opposed to countries that will adopt the CRS later, or never. The lists of participating countries for each of these events are presented in table A.5. Main early-adopters include European Union countries, Canada and China while non-adopters include most countries from the Arabian Peninsula, Russia, Hong Kong, Iran, North Africa.¹⁸ The United States implements its own bilateral exchange of information policy, FATCA, and thus is not included in our list of early adopters at baseline. We show later that classifying them as early adopters has very little effect on our results.

Data and sample restrictions. We rely on the full register of UK property transactions available in the OCOD dataset presented in section 3.1. This dataset is particularly relevant for studying the behavior of investors willing to circumvent the AEoI, as most of the foreign companies making real estate purchases are located in tax havens, thus providing a layer of anonymity to ultimate investors. We exclude from the dataset the small set of properties acquired by companies incorporated in non-haven countries, and transactions made after 2017 as new jurisdictions start to commit to the AEoI over time.¹⁹ We pool all purchases at the jurisdiction-quarter level. Our sample is a balanced panel of 50 tax havens over the 2000-2017 period.

Constructing a measure of exposure to the CRS. The OCOD provides information on the country of incorporation of the purchasing companies but not on the country of residence of their owners. It is therefore not possible to estimate the response to the AEoI directly, by comparing the evolution of property purchases by residents of CRS-adopting countries to those by residents of non-adopting countries.²⁰ To circumvent this issue, we leverage country-specific tax haven preferences, documented in Figure 1. Using the leaks data, we construct a measure of “CRS exposure” for each jurisdiction, equal to the share of company owners who reside in early-adopting countries.²¹ Formally, the exposure of haven h to the AEoI is defined as:

$$\text{Exposure}_h = \frac{\sum_c D_c \omega_{c,h}}{\sum_c \omega_{c,h}},$$

where $\omega_{c,h}$ denotes the number of distinct beneficial owners residing in country c who hold companies incorporated

¹⁸The relevant timing of the information exchange depends on the date at which both the residence country of the ultimate owner and the country where offshore assets are held enter the AEoI. This is because participating countries will start to exchange information with each other when they both enter the agreement. As some of the most important offshore financial centers are among the early-adopters (e.g. Switzerland), the date at which residence countries commit to the AEoI provides a good approximation of the timing of treatment for individuals. Note that individuals from early-adopting countries will be affected by the AEoI even if the offshore assets are held through a shell company incorporated in a non-participating country. In this case, the bank in which the assets are held will have to gather and exchange information on the ultimate owner of the assets, whether or not the shell company is incorporated in a country participating in the AEoI.

¹⁹In the robustness section, we show that the difference in investments between jurisdictions relatively more used by residents from CRS-adopting countries and other jurisdictions decreases in more recent years, as we would expect as new countries commit to exchange information and the differences in AEoI coverage diminish.

²⁰The data we exploit in this section include all transactions in the OCOD register, whether the ultimate owner is known or not. In the robustness section, we report additional results based on the sample of identified buyers only, in which the treatment group consists of identified owners residing in early-adopting countries.

²¹We process the Leaks data as explained in Appendix C. In particular, we drop companies appearing as beneficial owners and to reallocate owners linked to tax havens to their most likely country of residence

in h before the second quarter of 2013, and D_c equals one if country c is an early adopter, and zero otherwise. $Exposure_h$ is thus the fraction of haven h 's pre-existing beneficial owners who reside in countries participating in the AEOI before the policy is implemented. It is bounded between 0 and 1: a haven whose owners all reside in participating countries has $Exposure_h = 1$, whereas a haven serving only non-participating owners has $Exposure_h = 0$. If a jurisdiction does not appear as a country of incorporation in the leaks (or if fewer than ten distinct owners hold a company there) we set its exposure to zero.²² We measure the links $\omega_{c,h}$ before the transparency shock so that the exposure measure is not itself affected by a response to the policy; we show in the next section that our results are robust to defining $\omega_{c,h}$ using companies incorporated after 2013.²³

Figure 4 illustrates the distribution of CRS exposure among tax havens in our sample, focusing on the 30 most important buyers (more than 99% of all investments). There is a clear link between the CRS exposure measure and the variation in tax haven use across world regions presented in Figure 1. For instance, jurisdictions like Jersey, Luxembourg and Malta attract a relatively large number of European investors and are therefore highly exposed to the CRS, given that most European countries were early-adopters of the policy. In contrast, territories such as the British Virgin Islands, Cayman Islands and the Bahamas draw investors from a more diverse range of regions, including those that did not commit to the AEOI in 2014, resulting in lower CRS exposure. If investors seeking to circumvent the AEOI allocate part of their offshore wealth to real estate through shell companies incorporated in their preferred tax havens, we would expect a relative increase in purchases routed through the most exposed jurisdictions. Investments from less exposed havens, by contrast, should be less responsive to the AEOI, since these jurisdictions also attract many investors unaffected by the policy. In Section 4.3, we discuss the potential weaknesses of our exposure measure at length and show that our results hold under three alternative exposure measures.

Difference-in-differences specification. We estimate the response to the CRS in a difference-in-differences setting using CRS exposure as the treatment. The treatment is thus defined at the jurisdiction level and is continuous. We estimate the following equation:

$$Y_{hq} = \gamma_h + \eta_q + \sum_{j \neq 2013q2} \beta^q \cdot Q_{j=q} \cdot Exposure_h + v_{hq} \quad (2)$$

where Y_{hq} denotes the real estate investment outcome for tax haven h in quarter q (in 3-quarters moving averages).

²²Twenty-eight havens have a CRS exposure of zero. The ten owners required to remain in our sample have to have incorporated their company before 2013q2 and be individuals rather than a company themselves. We show in section 4.3 that our results hold when these havens are excluded.

²³Note that a tax haven may be highly exposed to the AEOI even if it did not commit to the policy itself. Because tax havens specialize in different activities, the jurisdictions used to incorporate the shell companies that buy UK property are typically not the ones where the hidden bank accounts were held. Consider an individual with an undeclared bank account in Switzerland. In anticipation of the CRS, they may close the Swiss account and invest in UK property instead, but there is no reason they would do so through a Swiss shell company rather than one incorporated elsewhere. If they use a Jersey company, the purchase appears in the data as investment from Jersey, even though the shock driving it is the adoption of the CRS by the individual's country of residence (and by Switzerland, or wherever else the hidden assets are held). It is therefore the exposure of the owner's residence country, together with that of the jurisdictions where the hidden financial assets are held, that drives the response, not the exposure of the jurisdiction of incorporation.

Our main outcome variables are investment in value (million Pounds), investment in value scaled by pre-AEoI investment (2012q3-2013q2) and number of transactions. $Q_{j=q}$ is a quarter dummy equal to one when the quarterly date is equal to q . $Exposure_h$ is the continuous measure of exposure to the CRS defined above. The reference period is the second quarter of 2013; i.e. a quarter before the endorsement of AEoI by G20 countries. We control for country-specific links to the UK real estate market by including country fixed effects γ_h and for common changes in the UK real estate market by including quarter fixed effects η_q . v_{hq} is the error term. The treatment variable being continuous, for the outcome expressed in million Pounds, a coefficient $\hat{\beta}^q$ of 100 in quarter q means that the average difference in real estate investment between fully exposed tax havens (exposure of one, meaning that the jurisdiction is only used by residents from early-adopting countries) and non-exposed tax havens (exposure of zero) is higher by £100 million in quarter q compared to the reference period.

We also estimate a static version of equation (2), comparing our reference period (2013q2) with the post-AEoI period (2013q3-2016q4) to summarize the average response to the transparency policy in a single coefficient. We define the post-AEoI period to end in the last quarter of 2016, as the first exchanges of information take place in 2017, although the rebalancing continues beyond that date. The implied effect of the AEoI on UK real estate investments follows from multiplying this coefficient by the number of post-AEoI quarters (14), the average exposure to the CRS (0.29) and the number of tax havens in the sample (50).

4.2 Results

As first descriptive evidence, Figure 5 shows total real estate investments from firms incorporated in “highly-exposed” tax havens, defined as jurisdictions with a CRS exposure higher than or equal to 75%, and from firms incorporated in all other tax havens. The flows of investments follow each other closely during a very long period spanning from 2000 to mid-2013 before diverging sharply in the third quarter of 2013, precisely when the G20 countries endorse automatic exchange of information. From this period, we observe a large jump in real estate investments from highly-exposed jurisdictions, that is not matched by investments from the other tax havens.

Results from the estimation of equation (2), summarized in Table 2, are discussed below. Figure 6a plots the coefficients $\hat{\beta}^q$ estimated from the specification with our outcome variable in million Pounds. The figure shows that once the G20 endorses automatic information exchange in the third quarter of 2013, investments from tax havens that are relatively more exposed to the CRS accelerate sharply compared to investments from other havens. While pre-period coefficients display a gradual upward drift (statistically significant in the early 2000s, indistinguishable from zero from 2005 onward) the coefficients depart sharply from this pattern from 2013q3 onward (see Appendix Figure A.5 for sensitivity to violations of parallel trends, following Rambachan and Roth, 2023). After September 2013, the estimated gap in quarterly purchases between fully exposed havens and havens with zero exposure widens

rapidly, reaching almost £200 million by the end of 2015. The first column of Table 2 reports an average difference in investment of £136 million over the post-AEoI period (2013q3-2016q4). As the last row of the table shows, the estimated response to the AEoI implies that in the three and a half years following the endorsement of the policy, an additional USD 43 billion was invested in the UK real estate market through shell companies held by residents of early-adopting countries. As column 2 shows, the estimate amounts to USD 24 billion for London only. Section 7 discusses the implications of this figure for our understanding of the CRS and its effectiveness.

A concern with outcome variables in levels is that large variations in investments in a small subset of countries can affect the estimations. Because the outcome is frequently zero in our sample, we cannot address this with a log transformation. Instead, we scale each jurisdiction's outcome by its level before the announcement of the AEoI: we divide quarterly investment routed through jurisdiction h by its average quarterly value between the third quarter of 2012 and the second quarter of 2013.²⁴ Figure 6b reports the results. Under this specification, investment does not differ significantly before the AEoI, but diverges sharply from September 2013 onward. A coefficient of 1 in quarter q means that, relative to the reference quarter, investment in fully exposed havens (exposure of 1) increased by 100 percent of their own average pre-AEoI quarterly investment, relative to non-exposed havens (exposure of 0). As reported in the second row of Table 2, the post-AEoI coefficients average to 1.0: the increase in investment attributable to the AEoI therefore is approximately equal to the average quarterly amount invested in the preceding year. As an alternative way of handling zeros, Appendix Figure A.6a reports estimates from a Poisson pseudo-maximum-likelihood (PPML) specification, which are comparable (see row 3 of Table 2 for the static DiD estimate).

Decomposing the number of transactions by price range suggests that the observed rise in real estate investment is mostly driven by expensive properties. Figure 7 reports the estimates from equation 2, separately for transactions priced below and above £2 million. Panel (a) shows that although purchases below £2 million increase around 2013, they are already on a diverging trend before the reform, which complicates any causal interpretation. In contrast, Panel (b) displays a much clearer increase in the number of expensive purchases right after the commitment to the AEoI: the gap between fully exposed and unexposed havens widens by more than 10 additional purchases per quarter on average, relative to the reference quarter, mirroring the pattern we obtain for the value of investment. This is what we would expect if the AEoI were pushing offshore users into the real estate market, as they are disproportionately drawn from the top of the wealth and income distribution (Alstadsæter, Johannesen and Zucman, 2019; Guyton et al., 2021; Londoño Vélez and Ávila-Mahecha, 2021).

4.3 Discussion on the Quality of our Exposure Measure

Our identification strategy relies on our measure of heterogeneous use of tax havens across countries built from the beneficial ownership data, mostly composed of leaked datasets. The key strength of such leaks is that they can be

²⁴The scaled outcome is winsorized at the 95th percentile. Results are robust to using other pre-AEoI reference periods.

seen as random events that offshore users could not predict, alleviating the concern of a strong selection bias. This randomness has allowed researchers to exploit leaked data in order to study the distribution of tax evasion ([Alstadsæter, Johannesen and Zucman, 2019](#); [Londoño Vélez and Ávila-Mahecha, 2025](#); [Collin, 2021](#)). Yet, a number of tax havens do not appear in the leaks as jurisdictions of incorporation of shell companies. Together, they account for 5.5% of all purchases over the sample period. This absence from the Leaks, which leads to an exposure measure of zero for these jurisdictions, hides two very different cases.

First, a tax haven may be absent from the Leaks simply because it is not widely used as a jurisdiction of incorporation for shell companies, either because it specializes in other activities, such as banking (Switzerland) or corporate tax planning (Ireland), or because its tax-haven status is itself debatable (e.g. Austria, Belgium, or Chile). Second, being based on individuals who used specific offshore service providers, the leaked data only provide a partial picture of the offshore world and we “miss” some important investment hubs by only relying on this data source. The two cases have different implications for our results and we discuss them in turn.

To identify jurisdictions corresponding to the first case, that is havens that are, in effect, “false positives”, we draw on [Aliprandi, Busschots and Oliveira \(2023\)](#). Leveraging a wide range of sources, the authors construct an indicator of shell company prevalence, defined as the number of registered companies per 1,000 working-age individuals, for more than 200 jurisdictions. The authors’ assumption is that an abnormally large number of registered entities relative to population signals the presence of shell companies with little or no economic substance. Unsurprisingly, this shell rate is high among tax havens, at 714 on average, with the British Virgin Islands recording more than 15,000 companies per 1,000 working-age individuals, followed by the Cayman Islands and the Seychelles. Non-haven countries, in contrast, have a modest average score of around 64.

While this metric has its own limitations, it offers a natural way to distinguish, among the havens absent from the Leaks, those that are not commonly used as jurisdictions of incorporation from those missing because of the incompleteness of the data. To determine the threshold separating the two cases, we examine how the fraction of jurisdictions classified as tax havens varies with the shell rate. As shown in Appendix Figure A.4, above roughly 200 companies per 1,000 working-age individuals, more than half of jurisdictions are havens. Eighteen havens in our list that do not appear in the Leaks as jurisdictions of incorporation, including Switzerland, fall below this threshold, indicating that these jurisdictions are not widely used to incorporate companies.²⁵

The extent to which investment routed through them is informative about responses to the CRS is thus unclear. To assess the sensitivity of our results, we re-estimate our main specification excluding havens with both a zero CRS exposure and a shell rate below 200. As reported in column 4 of Table 2, this restriction yields a comparable estimated response and leads to an aggregate effect of the AEOI on offshore real estate investment in the UK very close to our

²⁵Jurisdictions in which we observe fewer than ten owners of companies in the Leaks data also fall into this category. These jurisdictions are Austria, Bahrain, Belgium, Chile, Costa Rica, Grenada, Ireland, Jordan, Lebanon, Liberia, Macao SAR China, San Marino, St. Lucia, St. Vincent & the Grenadines, Switzerland, Trinidad & Tobago, Uruguay and Vanuatu.

baseline, at USD 47 billion (Appendix Figure A.8a reports the corresponding dynamic estimates). This also holds under alternative thresholds of shell-company prevalence: using cutoffs of 100 and 300 (columns 3 and 4 of Appendix Table A.4) changes the estimates very little, to USD 46 and 49 billion, respectively. Column 5 reports estimates obtained when excluding all havens with an exposure of zero (Appendix Figure A.8d reports the dynamic estimates). This specification yields a substantially larger aggregate effect, at USD 87 billion. Assigning a zero exposure to havens that are in fact used by residents of CRS-adopting countries understates the true variation in exposure and attenuates our estimates; the baseline should therefore be read as a lower bound on the response to the AEoI.

Second, the Leaks have their own limitations and may not provide a comprehensive picture of the global distribution of shell company ownership. Jurisdictions such as Gibraltar and Liechtenstein, which are well-known tax havens with shell company prevalence scores above 600, are absent from this source even though they plausibly channel substantial offshore wealth. We address this concern by constructing three alternative CRS exposure measures. The first is based on data from the Bank for International Settlements (BIS), which report bilateral cross-border bank deposits for 48 reporting countries. For each haven, we measure exposure as the share of deposits held by residents of early-adopting countries. The second alternative measure leverages Orbis: for each jurisdiction in our list, we extract every company incorporated there together with its ownership information and compute the share of ownership attributable to residents of early-adopting countries, yielding a measure conceptually close to our baseline. The third measure starts from the baseline measure and imputes exposure for jurisdictions with zero exposure using a gravity model. Appendix Section E describes each construction in detail.

The last three columns of Table 2 report the corresponding results (Appendix Figures A.7a, A.7b and A.7c present the dynamic estimates). All three alternative measures deliver statistically significant rebalancing responses, with higher exposure consistently associated with higher real estate investment in the post-AEoI period. The BIS- and Orbis-based measures yield aggregate responses of USD 38 billion and USD 52 billion respectively, bracketing our baseline estimate of USD 43 billion. The gravity-based measure yields a substantially larger response, at USD 129 billion, driven by the assignment of a positive exposure to every haven, which raises the total exposure and hence, the estimated aggregate effect. The main take-away from this exercise is that, regardless of how we measure exposure to the AEoI, there is a significant response to this transparency policy, leading to large flows of offshore wealth into the UK real estate market. The fact that some havens that are likely highly exposed to the transparency policy are assigned an exposure of zero suggests that our baseline provides a conservative estimate of the aggregate effect of the AEoI on the UK real estate market.

Our analysis also assumes that tax haven use by country of ultimate ownership is persistent and in particular that it does not respond to the AEoI itself. This is plausible: while the CRS has been shown to shift the location of offshore bank deposits (Casi, Spengel and Stage, 2020), it did not alter the incentives governing the choice of jurisdiction of incorporation for holding vehicles. To validate this assumption, we construct an alternative exposure measure using

only owners of shell companies incorporated after the implementation of the CRS. Appendix Figure A.7d shows that the resulting estimates are qualitatively and quantitatively similar to our baseline. Finally, Appendix Table A.4 shows that adding the United States (which implemented its own automatic exchange regime under FATCA) to our list of early adopters has a limited impact on our estimate (see Appendix Figure A.7e for the dynamic estimates).

5 Robustness Checks

5.1 Sample of Identified Owners

In our main analysis, we build a measure of exposure to investors from early-adopting countries at the level of the jurisdiction of incorporation. This allows us to circumvent the fact that we do not observe the buyer’s country of residence, but at some cost. First, treatment is not directly observed: our measure captures the likely exposure of each haven’s clientele rather than the treatment status of individual buyers. Second, we cannot account for the staggered adoption of the transparency policy. Indeed, as more countries join the AEOI over time, real estate investment should increasingly originate from a broader set of countries, not only from residents of early adopters. This is visible in Appendix Figure A.6c, which extends our baseline specification through the end of 2019: the estimated effect fades toward the end of the period, consistent with initially less-exposed havens becoming treated as more of their clients’ countries adopt the AEOI.²⁶

As a robustness check, we focus on the subset of transactions where the ultimate owner can be observed in the Leaks and Register of Overseas Entities data, allowing us to define treatment at the level of the owner’s country of residence rather than the country of incorporation. For this exercise, we match the entire OCO register to the Leaks and Register of Overseas Entities, following the procedure described in Appendix Section D. Appendix Table A.2 summarizes the result of the matching procedure, which allows us to identify the company owners for about 1/3 of the transactions.²⁷ Using this subsample, we are able to distinguish, among countries that are not early adopters, those that adopt late from those that never adopt.²⁸

Specifically, we estimate a difference-in-differences specification with a binary treatment variable equal to one if the property is purchased by a resident of an early-adopting country and zero otherwise. We do so on two samples: one in which the control group pools late and never adopters, and one with a “clean” control, restricted to never

²⁶This pattern is also consistent with the reallocation stopping after the first waves of exchange have taken place.

²⁷Appendix Figure A.9a presents the matching rate over time. Note that for this exercise, we need to assume that the owners of a given company have not changed between the transaction date and the date of the leak or the date of release of the ROE.

²⁸Never adopters are defined as countries that either adopted the AEOI after 2020 or have not adopted it at all. This group comprises Albania, Algeria, Angola, Armenia, Belarus, Benin, Bosnia and Herzegovina, Botswana, Burkina Faso, Cabo Verde, Cambodia, Cameroon, Chad, Congo (Republic of the), Côte d’Ivoire, Democratic Republic of the Congo, Djibouti, Dominican Republic, Ecuador, Egypt, El Salvador, Eswatini, Fiji, Gabon, Georgia, Guatemala, Guinea, Guyana, Haiti, Honduras, Jamaica, Jordan, Kazakhstan, Kenya, Lesotho, Liberia, Madagascar, Maldives, Mali, Mauritania, Moldova, Mongolia, Montenegro, Morocco, Namibia, Niger, North Macedonia, Palau, Papua New Guinea, Paraguay, Philippines, Rwanda, Senegal, Serbia, Sierra Leone, Sri Lanka, Tanzania, Thailand, Togo, Tunisia, Uganda, Ukraine, Uzbekistan, Viet Nam, Zambia and Zimbabwe. Late adopters are countries that are neither early nor never adopters.

adopters only. Our analysis period runs from 2005 to 2017.²⁹ As the sample is much smaller than before, we aggregate observations at the country-semester level. The model is defined as:

$$Y_{is} = \gamma_i + \eta_s + \sum_{j \neq 2013_{s1}} \beta^s \cdot S_{j=s} \cdot Treat_i + v_{is} \quad (3)$$

where Y_{is} denotes the amount in million Pounds invested in real estate by residents from country i in semester s , $Treat_i$ is a dummy equal to 1 when country i commits to the AEoI in 2013 or 2014, γ_i is a country fixed effect, η_s a semester fixed effect and v_{is} an error term. The difference-in-differences coefficient β^s captures the effect of country i committing to AEoI on real estate investments from residents of country i during semester s , relative to the pre-reform semester 2013_{s1}.

Appendix Figure A.9b shows the results when the control group consists of both late and never adopters, while Appendix Figure A.9c shows the results using only never adopters as controls. Both confirm that the increase in property purchases documented in the previous section is indeed driven by individuals affected by the CRS: real estate investment does not differ significantly between treated and control countries between 2005 and the first semester of 2013 and the treated group increases its investment immediately after the endorsement of the AEoI by G20 countries. Moreover, once residents of late-adopting countries are removed from the control group, the estimated rebalancing response is larger, averaging £15 billion against £11 billion over the post-AEoI period, consistent with residents of late-adopting countries investing in real estate once they too become subject to the transparency policy. Appendix Figure A.9d plots the time series for the three adoption groups. Investment by never adopters remains flat throughout, while late adopters raise their investment only after early adopters do, as staggered adoption would predict.

Overall, even if these results are to be interpreted with caution due to the small size of our identified sample, they indicate that individuals react to their country of residence committing to automatically exchange information by increasing their UK real estate investments through shell companies.

5.2 Tax Reforms

Since 2012, the UK has introduced several tax reforms affecting the purchase and ownership of properties by companies. These reforms, detailed in Appendix Section G, include changes to Stamp Duty Land Tax (SDLT, March 2012), the introduction of the Annual Tax on Enveloped Dwellings (ATED, April 2013), the expansion of Capital Gains Tax (CGT, April 2015) and the broadening of the Inheritance Tax base (IHT, April 2017). While these reforms likely affected offshore investors' decisions to purchase UK properties, they are unlikely to pose a significant issue in our analysis for two reasons. First, for these reforms to confound our results, they would need to have a differential impact on investors with relatively higher versus lower exposure to the CRS. Second, as these changes generally *increase* the

²⁹For visibility, our analysis period starts in 2005, but starting in 2000 does not change the results.

tax liabilities for UK property owners, it is reasonable to think that if anything, the observed rebalancing response to the AEoI would have been even larger in the absence of these reforms.

As a first robustness check, Section 6.2 shows that our estimates of equation (3) still hold after excluding British investors, for whom UK tax reforms may be more salient than for other investors: the effect is smaller but persists. Moreover, these tax changes primarily affect residential properties while the incentives to acquire or hold commercial properties remain largely unaffected.³⁰ Thus, we test for the potential confounding effect of the tax reforms further by estimating the response to the AEoI separately for residential and commercial properties. More specifically, we estimate the following equation:

$$Y_{hqt} = \gamma_h + \eta_q + R_t + \sum_{j \neq 2013q2} \beta^q \cdot Q_{j=q} \cdot Exposure_h + \sum_{j \neq 2013q2} \beta^{qt} \cdot Q_{j=q} \cdot Exposure_h \cdot R_t + v_{hqt} \quad (4)$$

where Y_{hqt} denotes the investment (in million Pounds) in property of class t (residential (R) or commercial (C)) from tax haven h in quarter q . $Exposure_h$ is the continuous measure of exposure to the CRS, R_t is a dummy equal to one when the property is of residential class, $Q_{j=q}$ is a quarter dummy, γ_h is a country fixed effect, η_q a quarter fixed effect and v_{hqt} an error term. Appendix Figure A.6b presents the results. There is a clear effect of the AEoI both for residential and commercial properties, alleviating the concerns about a strong confounding effect of the tax reforms.

5.3 Missing prices

Finally, 47% of the transaction prices in the estimation sample are inferred (see section 3.1). To address concerns about the potential impact of inferring prices on our results, we first estimate equation (2) using a restricted estimation sample that includes only transactions where the price is observed. Results are close to our benchmark specification. As shown in Table 2, column 3, it has a limited impact on the estimated response, with a total rebalancing estimate of USD 40 billion (see Appendix Figure A.8c for the dynamic DiD graph). Then, we investigate in Figure A.6d whether CRS exposure is correlated with the purchase of properties with missing prices, both before and after the implementation of AEoI. We find no significant correlation between CRS exposure and the likelihood of purchasing properties with missing prices. Taken together, these findings show that the inclusion of inferred transaction prices in the analysis does not substantially impact the robustness and validity of our main results.

³⁰Commercial properties are still affected by some of these tax changes. First, an important tax change for commercial properties happened in 2019, with the extension of the Non-Resident Capital Gains Tax to commercial properties. However, we stop our analysis of the responses to the AEoI in 2018. Second, the business rates multipliers, which determine the business rates bill that the occupier of a non-domestic property will have to pay annually, are updated every year. The national multipliers go from 45.8p in 2012/13 to 49.7p in 2016/17. Special cases apply to the City of London, but we exclude this area in our sample (see Appendix section B). Third, the schedule of the Stamp Duty Land tax for non-residential properties changed in March 2016, increasing the tax liabilities for relatively more expensive properties (and reducing it for lower-value properties). However, this is a modest change relative to the evolution of the Stamp Duty Land tax schedule for residential properties.

6 Mechanisms

6.1 Tax Incentives vs. Secrecy Motives

Foreign property owners in the UK are subject to a range of taxes that might affect investors' incentives. Here, we focus on the main taxes and their evolution for properties held through offshore entities. Additional details, including how tax liabilities differ when the immediate owner is an individual rather than a company, are provided in Appendix Section G. During the period covered in this study, offshore ownership offered notable tax advantages. Purchasing or selling shares in the foreign company holding the property, rather than the property itself, avoided Stamp Duty Land Tax (SDLT) and Capital Gains Tax (CGT). UK properties held through offshore companies were exempt from inheritance tax (IHT) for non-residents and for UK "non-domiciled taxpayers" until 2017.³¹ Rental income was taxed at a flat 20% rate, often more favorable than the progressive income tax rates faced by individual owners. These advantages were increasingly counterbalanced by new taxes: the Annual Tax on Enveloped Dwellings (ATED), introduced in 2013, an annual lump-sum charge on high-value residential properties held through companies, and the extension of CGT to non-resident companies in 2015. Despite these reforms, offshore ownership remained relatively attractive during the study period, particularly for commercial properties, which were exempt from ATED, CGT and IHT (until 2019) and subject to lower SDLT rates.

In the language of Section 2.2, these institutional features pin down the source-based tax τ^S , which varies across property types: low for commercial property and higher for residential property. Regardless of the property type, domestic tax liabilities from holding offshore financial assets are more likely to exceed the threshold $\tilde{\tau}_j^*$ —the level of tax exposure above which rebalancing into real estate becomes worthwhile on tax grounds alone—for residents of high-tax countries. Consequently, following the introduction of the AEoI, taxpayers from these countries are more likely to invest in offshore real estate for tax evasion reasons, while those from low-tax countries are more likely to seek secrecy for other reasons. Non-tax motives for holding offshore real estate include money laundering, evading international sanctions, or other financial crimes, all of which share a common reliance on secrecy (Transparency International UK, 2015; Collin, Hollenbach and Szakonyi, 2022).³² In practice, the overall reallocation response documented in this paper is likely driven by a combination of tax incentives and other secrecy motives. Although it is not possible to formally quantify the relative importance of each channel, the differing tax treatment of residential and commercial properties provides some key insights: if tax incentives drive the response, it should be concentrated where the source-based tax burden is lightest, i.e. toward commercial properties.

First, the effect of the AEoI policy is large for commercial real estate (56% of the total effect), which is consistent

³¹Non-domiciled UK taxpayers, or "non-doms", reside in the UK for tax purposes but are not domiciled there. This status allows them not to pay tax on their foreign income as long as it is not repatriated to the UK. Non-doms are mostly found at the top of the income distribution (Advani et al., 2022).

³²For high-net-worth individuals in politically unstable countries, protecting assets from political reprisals is also often cited as a key reason for making use of tax havens (Harrington, 2016).

with the presence of a strong tax evasion motive. Second, since tax evaders are expected to favor the most tax-advantaged assets, a tax-driven response to the AEOI would imply a correlation between a country's tax level and its propensity to invest in commercial properties. To explore this, we analyze for each country the correlation between the share of commercial real estate in total UK real estate investments and the top marginal income tax rate. This analysis, conducted at the level of the ultimate owners' countries, uses the sample of identified buyers that we leverage in Section 5.1 and top marginal income tax rates by country in 2014, reflecting conditions at the time of the Joint Announcement.³³ Appendix Figure A.10 shows a positive correlation between the share of investment in commercial real estate in 2018 and the level of taxation in 2014, consistent with offshore investors from high-tax countries reallocating their portfolios to minimize tax liabilities. All in all, the combination of a series of tax increases on residential properties and the implementation of the AEOI may explain partly the importance of foreign-owned commercial real estate in the UK today.³⁴

6.2 British Investors

As discussed in Section 2.2, relative to a benchmark with full transparency on both financial and real estate assets, the rebalancing shifts tax revenue from the taxpayer's country of residence to the country where the property is located—in our setting, the United Kingdom. When British residents rebalance into UK property, however, the two countries coincide: part of the revenue forgone by the UK government through continued evasion is recaptured through source-based taxation, and no cross-country transfer occurs. This case may be quantitatively important in the UK: as shown in Section 3.3, property ownership through tax havens is particularly large among UK owners. In this subsection, we therefore examine the contribution of British residents to the estimated causal effect of the AEOI.

A first direct way of assessing the contribution of British investors is to return to the sample of transactions for which the ultimate buyer is observed in the Leaks or the Register of Overseas Entities (Section 5.1) and to estimate equation (3) comparing early adopters with never adopters, excluding British investors. Appendix Figure A.9e shows the results. The estimated response is lower in magnitude, averaging 50% of the response obtained with the full group of early adopters over the post-AEOI period. The response nonetheless remains clearly present.³⁵

Moreover, Figure 1 shows that the three tax havens with the highest concentration of UK company owners are Cyprus, Guernsey and Jersey: in our beneficial ownership data, around 50% or more of the companies incorporated in these jurisdictions are held by UK residents. Turning to the full estimation sample, we re-estimate equation (2) after excluding these jurisdictions. As shown in Appendix Figure A.8b, the estimated rebalancing is now smaller

³³We use the 2014 rates from the individual income tax rate table compiled by KPMG, available at <https://home.kpmg/sa/en/home/services/tax/tax-tools-and-resources/tax-rates-online/individual-income-tax-rates-table.html>.

³⁴In 2020, overseas capital is estimated to represent 51% of all investment in UK commercial real estate.

³⁵Appendix Figure A.7f reports the results of our baseline analysis when UK company owners are excluded from the estimation of the havens' CRS exposure measure, with minimal effects. This absence of change does not mean that UK investors do not buy UK real estate in response to the AEOI. It means instead that they tend to use the same havens as investors from other early-adopting countries, so that excluding them barely changes the distribution of exposure across havens.

in magnitude but remains clear. According to Appendix Table A.4, the total rebalancing is approximately USD 20 billion, about 50% of our baseline estimate. While excluding these three jurisdictions does not perfectly separate UK from non-UK owners, the exercise is still informative and suggests that UK residents account for a sizeable but far from complete share of the reallocation, with non-UK residents also likely to be driving a substantial rebalancing toward the UK property market.

7 Implications for the Effectiveness of the AEoI

How much of the offshore wealth that the AEoI pushed out of tax havens was recaptured by real estate? To answer this, we scale our UK estimate to a global figure and compare it to the financial wealth that left tax havens in response to the policy. Given the inherent challenges in identifying tax evasion responses, a word of caution is necessary. First, exercise combines our estimate with external inputs that are measured far less precisely than our own estimate: the size of offshore financial wealth, its response to the AEoI and the share of global offshore real estate held in the UK. Second, we observe only one side of the portfolio rebalancing, namely the rise in offshore real estate investment; the substitution away from financial assets is therefore inferred rather than directly observed. The resulting figures therefore imply a margin of error; they are summarized in Table 3.

From the UK to a global real estate response We estimate that the AEoI led to about USD 43 billion of additional investment in UK real estate through tax havens, of which USD 24 billion in London. We scale this effect to the world in two ways. First, [Alstadsæter et al. \(2024\)](#) value offshore residential real estate in seven major cities and regions in 2019 (Paris, the Côte d’Azur, London, Dubai, Singapore, Amsterdam and Oslo), of which London accounts for about 36%.³⁶ If London’s share of the AEoI response mirrors its share of this total, our London estimate scales to roughly USD 68 billion across these seven locations—a lower bound, as it covers only seven markets. Second, the UK accounted for about 20% of worldwide cross-border real estate transactions in 2016 ([Tranio, 2017](#));³⁷ assuming the UK also captured 20% of the global reallocation triggered by the AEoI, our estimate scales to about USD 213 billion worldwide.

How much financial wealth left tax havens? We first estimate the offshore financial wealth held by residents of early-adopting countries in 2013. Drawing on [Alstadsæter, Johannesen and Zucman \(2018\)](#), we allocate their 2013 es-

³⁶Offshore real estate is valued at USD 136 billion in Dubai, USD 76 billion in Singapore, USD 54 billion in Paris, USD 39 billion on the Côte d’Azur, USD 9 billion in Amsterdam and USD 4 billion in Oslo; these figures cover residential real estate only. For London we use our own estimate of USD 177 billion, which covers both residential and commercial property, as we cannot fully separate the two. This gives a total of USD 495 billion, of which London represents about 36%. Because the London figure includes commercial property while the others do not, this share is an upper bound.

³⁷Tranio estimate cross-border residential and commercial real estate transactions by combining several commercial data providers (Knight Frank, Cushman & Wakefield, Savills, Colliers, CBRE and Real Capital Analytics) with national statistical offices. They estimate total cross-border real estate transactions of USD 426.8 billion in 2016, of which about USD 86.1 billion in the UK.

timate of global offshore wealth (USD 7.7 trillion) across countries using 2007 shares and sum over the early adopters, obtaining approximately USD 4.6 trillion.³⁸ We then apply the estimated effect of the AEoI on haven deposits. Our preferred estimate comes from O'Reilly, Ramirez and Stemmer (2021), who study the same policy event as we do, the early adopters' commitment to the AEoI, formalized in the Joint Announcement of March 2014, and find that it reduced deposits held in tax havens by about 11%.³⁹ Studies that instead exploit the staggered adoption of the standard over a longer horizon find larger responses of up to 31.8% (Menkhoff and Miethe, 2019; Cusi, Spengel and Stage, 2020; Beer, Coelho and Leduc, 2019). Our preferred estimate implies that about USD 506 billion of offshore financial wealth left tax havens in response to the policy, rising to as much as USD 1,463 billion under the largest estimate.⁴⁰

Magnitude of the rebalancing The comparison of the two suggests that a sizable share of the wealth that the AEoI pushed out of tax havens was rebalanced toward real estate. Under our preferred estimate of the offshore deposit response, real estate absorbed about 42% of this outflow worldwide (USD 213 billion out of USD 506 billion), a share that falls to 15% under the largest deposit-response estimate. The corresponding figures are 8% for the UK alone, 5% for London and 14% for the seven cities studied by Alstadsæter et al. (2024). Real estate thus appears to be a major margin of evasion from the AEoI, which has undermined its effectiveness.

Moreover, some taxpayers responded to the AEoI not by moving their assets but by reporting wealth they kept offshore (Boas et al., 2024; Davoine et al., 2026).⁴¹ This suggests that the AEoI may have affected offshore wealth even when that wealth was not moved out of tax havens. A natural alternative benchmark for our rebalancing result is therefore the total stock of non-compliant offshore financial wealth in 2013: following Alstadsæter, Johannesen and Zucman (2019); Boas et al. (2024), we take this to be 90% of the offshore financial wealth held by residents of early-adopting countries. Relative to this stock, our global estimate implies that around 5% was shifted into real estate in response to the AEoI.

8 Conclusion

The Automatic Exchange of Information constitutes a credible threat to offshore users who do not declare their financial assets and income to the tax authorities. Its multilateral nature makes it difficult for individuals to relocate their assets to non-cooperative tax havens, as more than 100 jurisdictions now automatically exchange information with

³⁸Of the 67 countries in the G20 (excluding the United States and Russia) or participating in the Joint Announcement or the OECD Declaration on Tax Matters, we retain the 42 non-haven countries, using the classification of Menkhoff and Miethe (2019). We further drop Greenland and the Faroe Islands, for which Alstadsæter, Johannesen and Zucman (2018) provide no estimate, leaving 40 countries.

³⁹Based on a two-period difference-in-differences model using Bank for International Settlements (BIS) cross-border deposits data.

⁴⁰These figures should be read with caution, as the underlying studies estimate the effect of the AEoI on bank deposits rather than on total financial wealth; if the response varies across asset types, the aggregate rebalancing may differ from estimates based on deposits alone.

⁴¹For the compliance response to the AEoI in Denmark, Boas et al. (2024) estimate that around DKK 6 billion began to be reported by taxpayers, compared with DKK 10.5 billion repatriated from abroad. Self-reporting thus representing 57% of the amount repatriated. See Section 5.2 of their paper.

one another. As such, it has reduced the amount of bank deposits held in tax havens. However, by targeting financial assets only, the policy leaves the door open for new evasion strategies: in its current form, it gives non-compliant taxpayers an incentive to restructure their offshore portfolios away from financial assets and toward real estate.

In this paper, we provide evidence that this loophole channeled around \$43 billion of real estate investment into the UK over the 2013–2016 period, suggesting that substantial investments have been made in property worldwide to circumvent the new reporting obligations. By documenting this reshuffling response to the AEOI, our results imply that excluding real estate from the reporting requirements is an important design flaw of the policy.

Recognizing this gap, 26 jurisdictions committed, in a joint statement issued on December 4, 2025, to joining the OECD’s new Multilateral Competent Authority Agreement on Automatic Exchange of Readily Available Information on Immovable Property (IPI MCAA) by 2029 or 2030, while encouraging other jurisdictions to follow. This is a clear improvement on the status quo and should limit, at least in part, the scope for rebalancing toward real estate. Its reach is nonetheless constrained: because it covers only “readily available information” and introduces no dedicated due-diligence procedure, it is likely to miss real estate held through complex ownership structures; and, so far, only a minority of jurisdictions have committed.⁴²

In parallel to joining the IPI MCAA, countries should therefore improve information on ultimate property ownership at the national level, so as to close the gap left by existing information-exchange treaties. Such an initiative was launched in the UK in 2022 with the Register of Overseas Entities (ROE), which, despite its limitations, has been shown to reduce offshore property purchases originating from tax havens (Collin, Hollenbach and Szakonyi, 2026). By combining better domestic beneficial-ownership information with a broader scope for the multilateral exchange of cross-border real estate ownership, policymakers can minimize the potential for new evasion strategies to emerge and build a more robust and effective framework for international tax transparency.

⁴²Similarly, the European Union already exchanges readily available immovable-property information automatically under DAC1, but only among its member states.

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Tables and Figures

	All transactions			Properties held in 2018		
	Full	Commercial	Residential	Full	Commercial	Residential
Prices all (GBP)	1,209,865	2,069,728	953,936	993,734	1,955,720	760,633
Prices observed (GBP)	1,715,838	4,170,151	1,209,556	1,435,870	3,867,190	991,679
London	49%	44%	50%	47%	48%	47%
Expensive London	24%	18%	25%	20%	20%	20%
Freehold	52%	69%	47%	56%	68%	53%
Residential share	77%	0%	100%	80%	0%	100%
Non-missing price	53%	39%	57%	43%	34%	45%
Transactions	103,924	23,837	80,087	93,366	18,211	75,155

Table 1: **Characteristics of the Properties Purchased**

Notes: This table displays the characteristics of the properties of the Overseas Companies Ownership Dataset we use to study the offshore real estate market in the UK. “All transactions” refer to all transactions over the 2000-2020 period. “Properties held in 2018” refers to the snapshot of properties held in 2018. The first and fourth columns present the characteristics of the sample, while columns “Commercial” and “Residential” show the characteristics of respectively commercial and residential properties. The row “All transaction prices (GBP)” gives the average price (observed + predicted) in the sample. The row “Observed transaction price (GBP)” presents the observed price, either directly (OCOD data) or indirectly (PPD data). The row “London” displays the share of transactions taking place in the Greater London area. The row “Freehold” shows the percentage of freehold properties in each category, the rest of the transactions corresponding to Leasehold titles. The row “Share of residential” displays the percentage of residential transactions in the two samples. The last row “Non-missing price” presents the percentage of transactions for which we observe a purchase price. The rest of the prices are estimated as described in Appendix section B.

	Baseline		Restrictions			Exposure		
	UK	London	Price info	Shell rate	Zero Expo	BIS	Orbis	Gravity
Panel A: Regression coefficients								
Amount invested (GBP Million)	136*** (28)	78*** (20)	127*** (25)	150*** (45)	278** (108)	99*** (29)	69* (41)	187*** (58)
Amount invested (scaled)	1.0*** (0.3)	0.8*** (0.3)	1.8*** (0.5)	0.8** (0.3)	2.0*** (0.5)	0.9*** (0.3)	1.1*** (0.4)	1.8*** (0.6)
Amount invested (PPML)	1.4*** (0.3)	1.1*** (0.3)	1.6*** (0.3)	1.6*** (0.3)	3.1*** (0.5)	1.5*** (0.3)	3.7*** (0.8)	2.9*** (0.5)
N Transactions < 2M	37.5** (15.1)	4.6 (6.9)	30.2*** (8.5)	41.0* (24.0)	72.5 (57.9)	25.6* (15.6)	16.6 (21.5)	47.9 (30.8)
N transactions > 2M	11.5*** (2.7)	5.9*** (1.9)	10.1*** (2.2)	12.7*** (4.3)	23.1** (10.4)	8.4*** (2.8)	5.8 (3.8)	15.7*** (5.5)
Panel B: AEoI effect on real estate investment								
N tax havens	50	49	48	32	22	50	50	50
Mean exposure	0.29	0.29	0.30	0.45	0.65	0.35	0.70	0.63
Total effect (GBP billion)	27	16	26	30	56	24	34	83
Total effect (USD billion)	43	24	40	47	87	38	52	129

Table 2: **Summary of the Results**

Notes: This table summarizes our difference-in-differences estimates of the effect of the AEoI on real estate investment routed through tax havens, obtained by estimating the compact version of equation (2), comparing our reference period (2013q2) with the post-AEoI period (2013q3-2016q4). All specifications include haven and quarter fixed effects and are estimated on a quarterly panel of transactions over 2000–2017. Panel A reports, for each outcome (rows), the coefficient on the interaction between CRS exposure and the post-reform indicator. The outcomes are the value of transactions—in GBP million (levels), scaled by each haven’s average pre-AEoI quarterly investment and estimated by Poisson pseudo-maximum likelihood (PPML)—and the number of transactions below and above GBP 2 million. Panel B reports the number of tax havens, the mean exposure across havens and the implied aggregate effect of the AEoI, obtained by scaling the coefficient in the first row (amount in GBP million) by the total exposure across havens and the 14 post-reform quarters; it is expressed in GBP and USD billion (2018 exchange rate). Columns: (1)–(2) baseline, for the whole UK and for London; (3)–(5) sample restrictions—properties with a recorded price, havens with a shell rate above 200 companies per 1,000 working-age individuals, or with non-zero exposure; (6)–(8) alternative exposure measures, based respectively on BIS banking statistics, Orbis and the gravity model. Standard errors are reported in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels.

Panel A: Effect of AEoI on Real Estate				
	UK	World	London	Big cities
Share of UK/London in total	100%	20%	100%	36%
Additional investment (USD billion)	43	213	24	68
Panel B: Offshore Financial Wealth				
	Percentage		USD billion	
Total offshore financial wealth	100%		4 600	
<i>Of which, leaves tax havens (preferred)</i>	11%		506	
<i>Of which, leaves tax havens (M&M 2019)</i>	32%		1 463	
<i>Of which, likely non compliant</i>	90%		4 140	
Panel C: Additional real estate investment, as a share of:				
	UK	World	London	Big cities
Outflows from tax havens (preferred)	8%	42%	5%	14%
Outflows from tax havens (M&M 2019)	3%	15%	2%	5%
Non-compliant financial wealth	1%	5%	1%	2%

Table 3: **Magnitude of the Rebalancing Response to the AEoI**

Notes: This table puts our estimate of the offshore wealth invested in real estate in response to the AEoI in perspective. Panel A reports the additional real estate investment attributable to the AEoI. Our directly estimated figures are USD 43 billion for the UK and USD 24 billion for London. We scale these to the world and to a set of seven major cities (Paris, the Côte d’Azur, London, Dubai, Singapore, Amsterdam and Oslo): the UK is assumed to account for 20% of worldwide cross-border real estate transactions (Tranio, 2017), giving USD 213 billion globally, and London for about 36% of offshore real estate in the seven cities (Alstadsæter et al., 2024), giving USD 68 billion. Panel B reports the stock of offshore financial wealth held by residents of early-adopting countries in 2013 (USD 4.6 trillion), the amount estimated to have left tax havens in response to the AEoI—between 11% under our preferred estimate (O’Reilly, Ramirez and Stemmer, 2021) and 31.8% under the largest available estimate in the literature (Menkhoff and Miethe, 2019), i.e. USD 506 to USD 1,463 billion—and the share of the stock likely to be non-compliant (about 90% of the total, following Alstadsæter, Johannesen and Zucman (2019); Boas et al. (2024)). Panel C combines Panels A and B, expressing the additional real estate investment as a share of these financial-wealth magnitudes. Real estate absorbed between 15% and 42% of the wealth that left tax havens worldwide (3%–8% for the UK, 2%–5% for London and 5%–14% for the seven cities); within each range, the upper bound corresponds to our preferred outflow estimate (O’Reilly, Ramirez and Stemmer, 2021). The last row benchmarks the same investment against estimates of total offshore financial wealth that is estimated to be non-compliant in 2013.

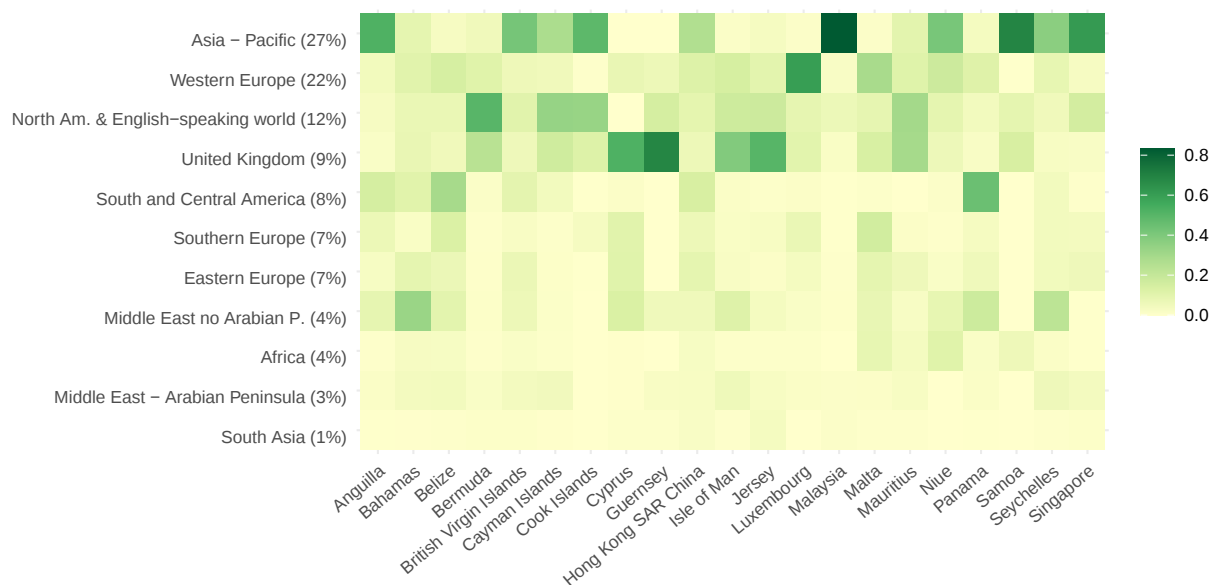


Figure 1: A Heterogenous Use of Tax Havens Across World Regions

Notes: This figure illustrates how investors from different world regions choose distinct jurisdictions for incorporating their companies. It focuses on jurisdictions used by at least 100 company-owner links in the leaks (Appendix Figure A.3a is a variation of this figure showing all jurisdictions with at least 10 company-owner links). The figure is a matrix of ownership shares, meaning that for each jurisdiction of incorporation, the total ownership is fully allocated across all world regions. The data underlying the figure come from the Bahamas Leaks, Offshore Leaks, Panama Papers, Pandora Papers, Paradise Papers, CNBIOM leaks and OpenLux database. The percentages in parentheses next to each world region indicate the relative share of company owners from that region in the leaks. Appendix Figure A.3b shows the same figure after excluding beneficial owners who are corporate entities and those linked to tax havens. Note that totals may not sum to 100% for some entries due to rounding.

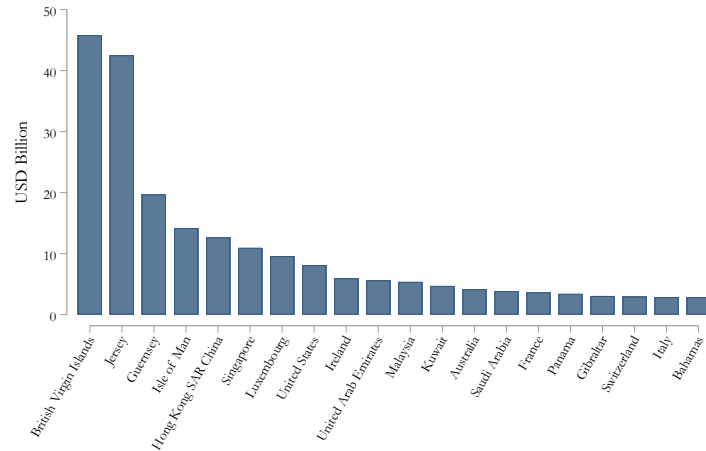


Figure 2: Country of UK Real Estate Owners, by Immediate Ownership

Notes: This figure displays the size of foreign owned real estate wealth by country of immediate ownership for the top 20 owners. Immediate ownership country is defined as the jurisdiction of incorporation for corporate ownership and as the country of correspondence address for direct ownership. Estimates are computed using the Overseas Companies Ownership Dataset (corporate ownership) and data on properties held by overseas individuals from the Centre for Public Data (direct ownership). All values are expressed in dollars (January 2018's exchange rate).

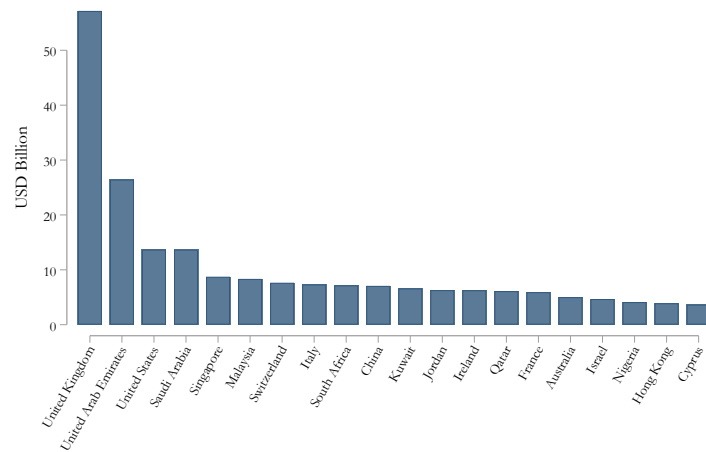


Figure 3: Country of UK Real Estate Owners, by Ultimate Ownership

Notes: This figure displays estimates of the size of foreign owned real estate wealth in England and Wales by country of ultimate ownership for the top 20 owners. We compute these estimates using the Overseas Companies Ownership Dataset (for properties held by foreign companies) and data from an FOI request made by the Centre for Public Data (for properties held by individuals with foreign correspondence addresses). The estimates are for January 2018. Ultimate ownership country refers to the property ultimate owner's country of residence. Ultimate ownership of properties is estimated following the method detailed in Appendix Section F. All values are expressed in dollars (January 2018's exchange rate).

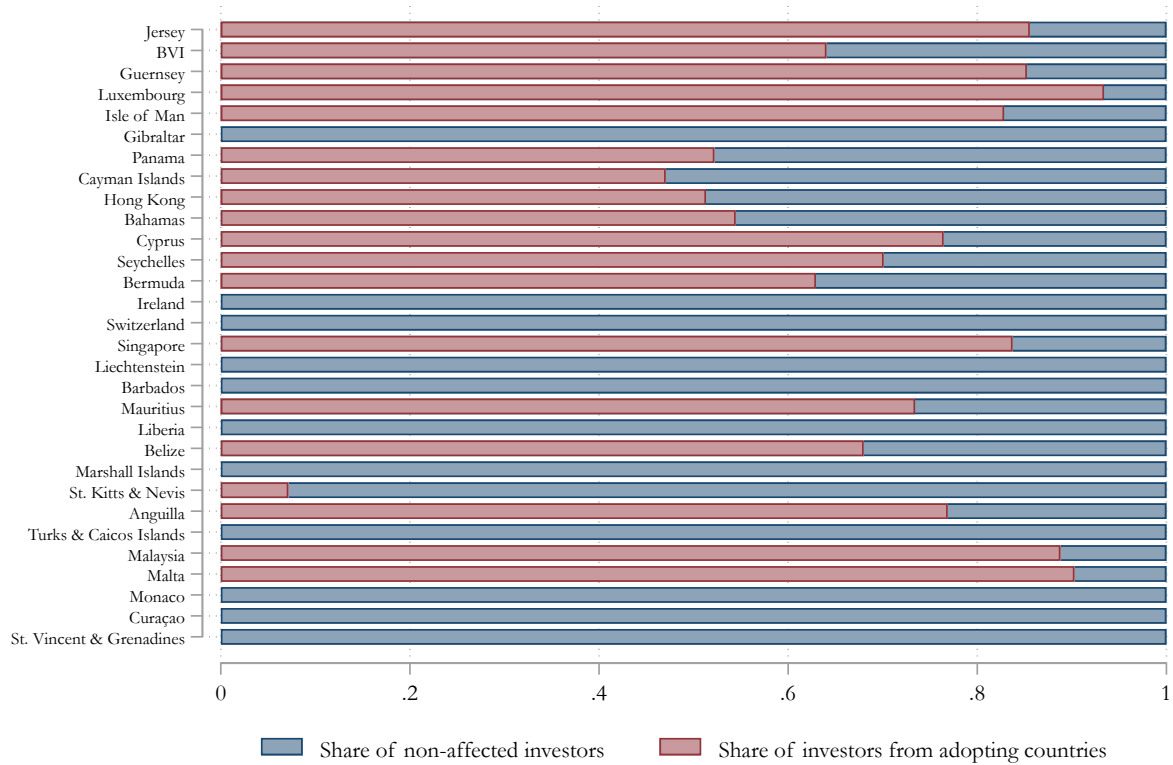


Figure 4: Distribution of CRS Exposure Amongst the Top 30 Tax Havens

Notes: This figure shows the distribution of exposure to the Common Reporting Standard for the 30 tax havens that channel the most UK real estate investment. Exposure to the CRS is defined as the share of investors affected by the CRS. It is computed using the Leaks data and the OpenLux data. We build it by computing, for each tax haven, the total share of individuals owning companies in that haven who reside in a country committing to the CRS early. A treatment intensity of e.g. 0.5 indicates that 50% of all company owners in the tax haven reside in countries participating in the Joint Announcement. Tax havens are ordered according to their importance in terms of flows of investments in the English and Welsh real estate market (e.g. Jersey is the most important buyer and it comes first).

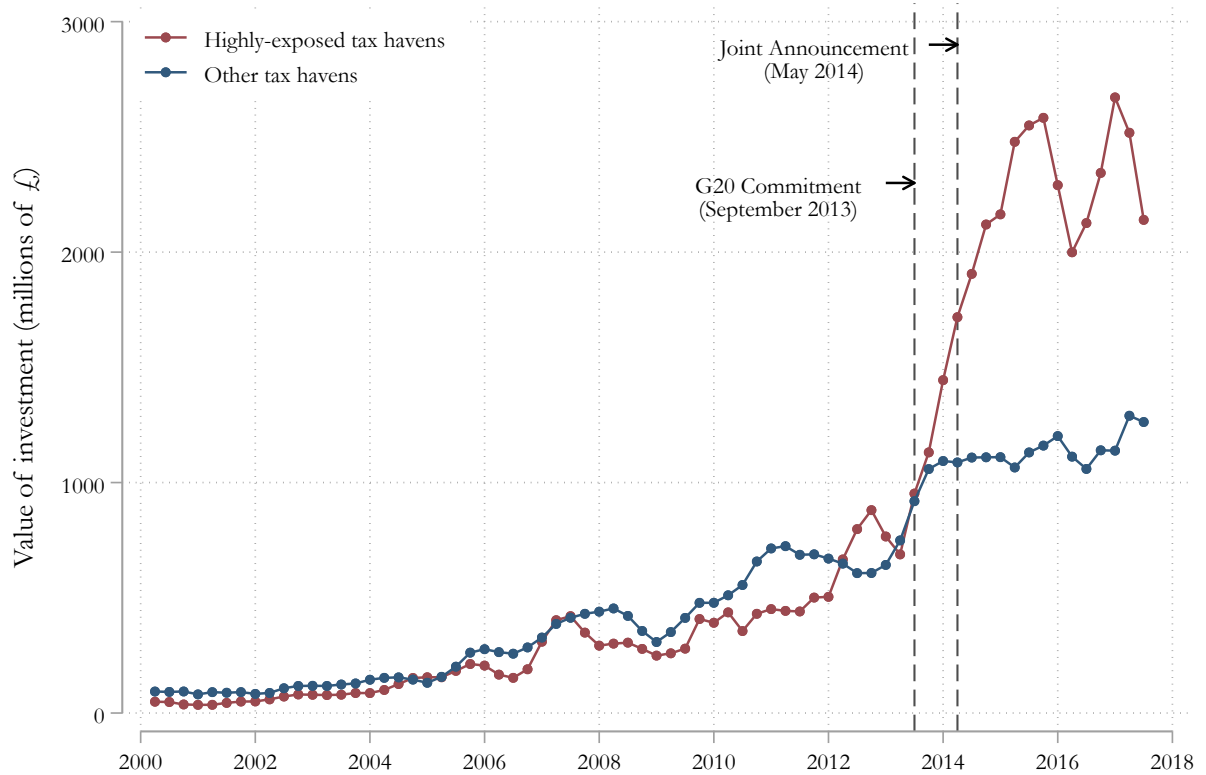


Figure 5: Total Value of Transactions from Companies Incorporated in “Highly-Exposed” Tax Havens vs Other Havens

Notes: This figure presents the aggregated amounts invested in England and Wales by companies incorporated in “highly-exposed” tax havens vs. companies incorporated in the other havens, over the period 2000-2017. It is based on the Overseas Companies Ownership Dataset. The measure of exposure to the CRS is computed using the beneficial ownership dataset (leaks data and OpenLux data). For each jurisdiction of incorporation h , we compute the proportion of company beneficial owners coming from countries adopting the CRS in 2013 or 2014. Highly-exposed havens are defined as havens with more than 75% of company owners coming from early-adopting countries. Other havens include all havens with less than 75% of company owners coming from early-adopting jurisdictions, or havens that host shell companies of fewer than 10 distinct owners in the beneficial ownership data. Investment is expressed in 3-quarters moving averages. Number of “highly exposed” tax havens: 9. Number of other tax havens: 41.



Figure 6: Difference-in-Differences with Continuous Treatment - Amount Invested

Notes: This figure plots the path of estimated β^q and their 95 percent confidence interval band from the difference-in-differences model summarized by equation 2. In this equation, the treatment is continuous and captures the exposure of each tax haven to the Common Reporting Standard. The outcome variables –expressed in 3-quarters moving average– are investment in million Pounds (Panel A) and investment scaled by country average investment one year before AEOI endorsement i.e. the period between the 3rd quarter of 2012 and the 2nd quarter of 2013 (Panel B). The pre-CRS coefficient β^{2013q2} is normalized to zero such that estimates can be interpreted relative to before commitment to the CRS. The estimation is based on investments made by tax havens in England and Wales, as captured in the Overseas Companies Ownership Dataset. Number of tax havens: 50.

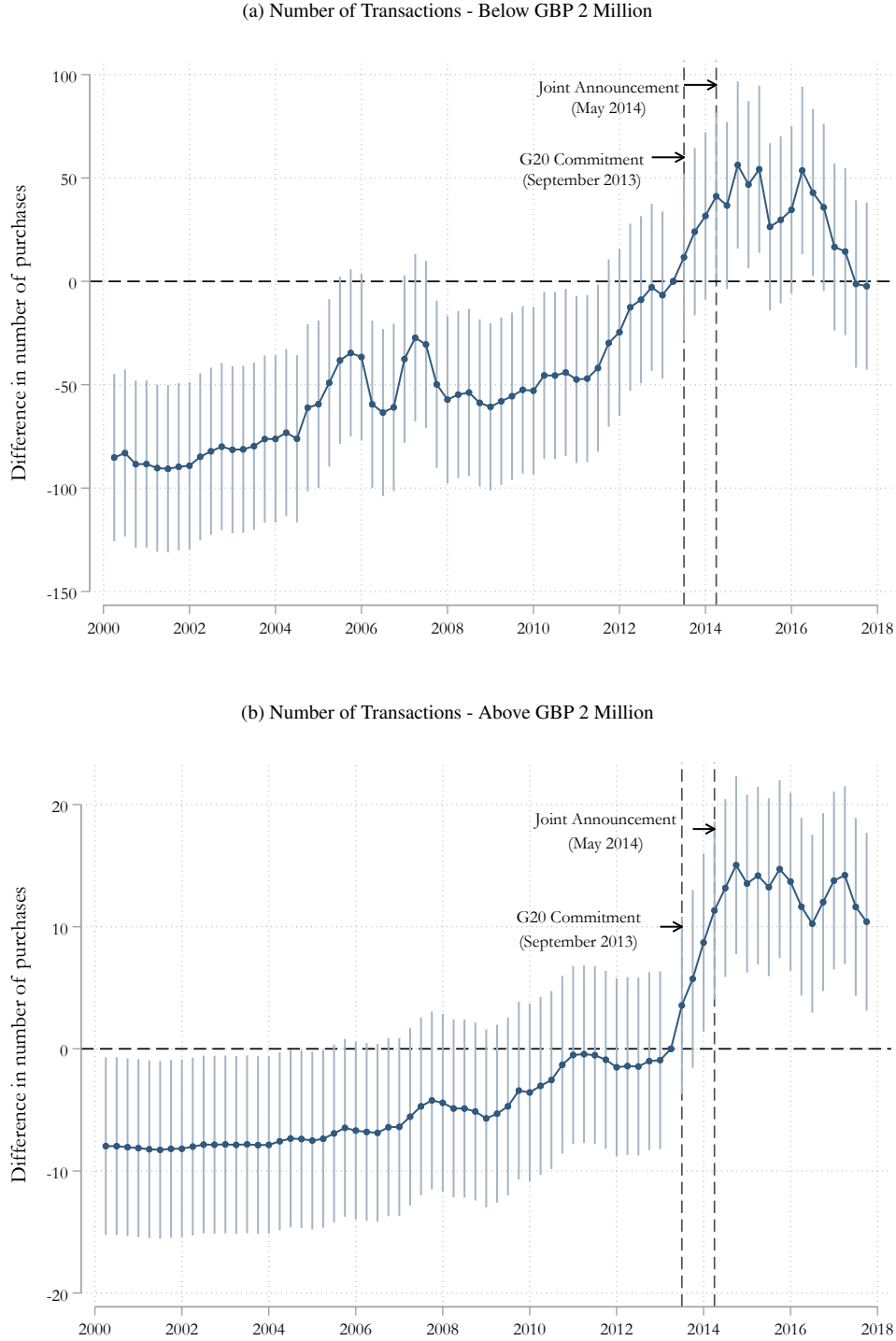


Figure 7: Difference-in-Differences with Continuous Treatment - Number of Transactions

Notes: This figure plots the path of estimated β^q and their 95 percent confidence interval band from the difference-in-differences model summarized by equation 2. In this equation, the treatment is continuous and captures the exposure of each tax haven to the Common Reporting Standard. The outcome variables—expressed in 3-quarters moving average—are number of properties costing less than £2 million (Panel A) and number of properties costing more than £2 million (Panel B). The pre-CRS coefficient β^{2013q2} is normalized to zero such that estimates can be interpreted relative to before commitment to the CRS. The estimation is based on investments made by tax havens in England and Wales, as captured in the Overseas Companies Ownership Dataset. Number of tax havens: 50.

Additional Materials for

Avoiding Transparency through Offshore Real Estate: Evidence from the United Kingdom

Jeanne Bomare

Ségala Le Guern Herry

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A Additional Figures and Tables

Panel A: Share of properties sold by 2021, depending on the year of purchase					
	2013	2014	2015	2016	2017
Non-haven countries	42%	58%	43%	25%	37%
Jersey & British Virgin Islands	41%	45%	55%	35%	26%
Other tax havens	51%	58%	49%	40%	22%

Panel B: Conditional on being sold by 2021, holding period					
	≤ 1 year	≤ 2 years	≤ 3 years	≤ 4 years	≤ 5 years
Non-haven countries	21%	56%	76%	92%	97%
Jersey & British Virgin Islands	31%	56%	73%	90%	97%
Other tax havens	23%	50%	75%	89%	96%

Table A.1: **Sale and holding periods of UK property held through overseas companies, by owner group**

Notes: This table describes the sale and holding behavior of UK properties held through overseas companies, grouped by the owning company's jurisdiction of incorporation (non-haven countries; Jersey and the British Virgin Islands; and other tax havens). Panel A reports, for each year of purchase from 2013 to 2017, the share of properties that had been sold by 2021. Panel B reports, among properties sold by 2021, the cumulative share sold within one to five years of purchase. Data are from the Overseas Companies Ownership Dataset (OCOD).

		Number of transactions	Amount invested (£ billion)	Fraction of total transactions	Fraction of total amount invested
	Full dataset	103,924	117.6	100%	100%
UK	Matched	54,727	57.2	52.7%	48.6%
	Identified	35,541	38.4	34.2%	32.6%
	Full dataset	50,708	80.6	100%	100%
London	Matched	27,601	41.1	54.4%	50.9%
	Identified	19,701	30.1	38.9%	37.4%

Table A.2: **Percentage of Companies Identified in the OCOD Estimation Sample**

Notes: This table shows the number of OCOD transactions we manage to link with their ultimate beneficial owners' using the Bahamas Leaks, the Offshore Leaks, the Paradise Papers, the Panama Papers, the Pandora Papers, OpenLux, CNBIOM data and the Register of Overseas Entities. Columns 2 and 3 show the raw number of transactions and their value in the full and matched samples, while columns 4 and 5 show the corresponding percentages the matched transactions represent. The "Matched" row shows these figures for all companies we find in one of these datasets. The "Identified" row shows these figures excluding companies whose beneficial owners are other companies (the estimation sample used in Section 5.1 consist of the 34.2% of transactions for which the beneficial owner can be identified, and is not itself a company).

	Period covered	Number of companies	Number of UBO
Bahamas Leaks	1919–2016	175,888	6
CNB IOM	2007–2019	1,406	927
OpenLux	1907–2020	261,249	70,795
Offshore Leaks	1918–2010	105,516	75,948
Panama Papers	1936–2015	213,634	238,055
Pandora Papers	1905–2019	29,221	41,745
Paradise Papers	1865–2017	290,086	133,590
Total		1,077,000	561,066

Table A.3: **Number of Companies and Ultimate Beneficial Owners by Source**

Notes: This table details the characteristics of the seven corporate ownership datasets we exploit in our analysis. For each dataset, it reports the period covered, the number of companies and the number of unique beneficial owners for which information is available. Across all sources, there are 393,758 unique owner names, of which 7,162 appear in more than one source.

	Restrictions				Exposure		
	With US	No JE-GG-CY	Shell<100	Shell<300	Keep all	Drop Cie if TH	Drop Cie & TH
Panel A: Regression coefficients							
Amount invested (GBP Million)	114*** (26)	77*** (20)	145*** (40)	156*** (49)	133*** (29)	152*** (30)	160*** (29)
Amount invested (scaled)	0.7*** (0.3)	0.9*** (0.3)	0.9*** (0.3)	0.9*** (0.3)	1.1*** (0.3)	1.1*** (0.3)	1.0*** (0.3)
Amount invested (PPML)	1.2*** (0.2)	1.3*** (0.4)	1.6*** (0.3)	1.8*** (0.3)	1.3*** (0.2)	1.3*** (0.2)	1.3*** (0.2)
N Transactions < 2M	31.8** (14.0)	18.9** (9.3)	40.4* (21.4)	42.4 (26.3)	36.7** (15.3)	42.2*** (15.8)	44.3*** (15.8)
N transactions > 2M	9.5*** (2.5)	5.2** (2.1)	12.4*** (3.8)	13.2*** (4.7)	11.1*** (2.7)	12.9*** (2.8)	13.7*** (2.8)
Panel B: AEoI effect on real estate investment							
N tax havens	50	47	35	30	50	50	50
Mean exposure	0.33	0.25	0.41	0.48	0.31	0.27	0.25
Total effect (GBP billion)	26	13	29	31	29	28	28
Total effect (USD billion)	41	20	46	49	45	44	44

Table A.4: **Summary of the Results - Robustness**

Notes: This table summarizes our difference-in-differences estimates of the effect of the AEoI on real estate investment routed through tax havens, obtained by estimating the compact version of equation (2), comparing our reference period (2013q2) with the post-AEoI period (2013q3-2016q4). All specifications include haven and quarter fixed effects and are estimated on a quarterly panel of transactions over 2000–2017. Panel A reports, for each outcome (rows), the coefficient on the interaction between CRS exposure and the post-reform indicator. The outcomes are the value of transactions—in GBP million (levels), scaled by each haven’s average pre-AEoI quarterly investment and estimated by Poisson pseudo-maximum likelihood (PPML)—and the number of transactions below and above GBP 2 million. Panel B reports the number of tax havens, the mean exposure across havens and the implied aggregate effect of the AEoI, obtained by scaling the coefficient of the first row (amount in GBP million) by the total exposure across havens and the 14 post-reform quarters. It is expressed in GBP and USD billion (2018 exchange rate). Columns (1)–(4) vary the sample or the definition of the treated group: (1) adds the United States to the set of early-adopting countries; (2) excludes the three havens for which the share of British owners is the highest (Cyprus, Jersey and Guernsey); (3)–(4) exclude zero-exposure havens with a shell rate below 100 and 300 companies per 1,000 working-age individuals, respectively. Columns (5)–(7) vary the treatment of ownership links when building the exposure measure: (5) keeps all links; (6) drops beneficial owners that are companies incorporated in a tax haven; and (7) drops all owners (companies and individuals) linked to a tax haven. Standard errors are reported in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels.

Country	Declaration	Joint Ann.	Country	Declaration	Joint Ann.
Anguilla		x	Latvia	x	x
Argentina	x	x	Liechtenstein		x
Australia	x		Lithuania	x	x
Austria	x		Luxembourg	x	
Belgium	x	x	Malaysia	x	
Bermuda		x	Malta		x
Brazil	x		Mauritius		x
British Virgin Islands		x	Mexico	x	x
Bulgaria		x	Montserrat		x
Canada	x		Netherlands	x	x
Cayman Islands		x	New Zealand	x	
China	x		Norway	x	x
Chile	x		Poland	x	x
Colombia	x	x	Portugal	x	x
Costa Rica	x		Romania		x
Croatia		x	San Marino		x
Cyprus		x	Saudi Arabia	x	
Czech Republic	x	x	Seychelles		x
Denmark	x	x	Singapore	x	
Estonia	x	x	Slovak Republic	x	x
Faroe Islands		x	Slovenia	x	x
Finland	x	x	South Africa	x	x
France	x	x	Spain	x	x
Germany	x	x	Sweden	x	x
Gibraltar		x	Switzerland	x	
Greece	x	x	Turkey	x	
Greenland		x	Turks & Caicos Islands		x
Guernsey		x	United Kingdom	x	x
Hungary	x	x			
Iceland	x	x			
India	x	x			
Indonesia	x				
Ireland	x	x			
Isle of Man		x			
Israel	x				
Italy	x	x			
Japan	x				
Jersey		x			
Korea	x	x			

Table A.5: **List of CRS Early Adopters**

Notes: This table shows the list of countries participating in the Declaration on Automatic Exchange of Information (May 2014) and to the Joint Announcement (March 2014). Note that the United States signed the May 2014 Declaration but do not participate in the Common Reporting Standard, and are therefore excluded from this table. We add The Faroe Islands, Greenland, Korea, Mauritius, San Marino and the Seychelles to the list of countries signing the Joint Announcement as they appear in the [Joint Statement by the early adopter group](#) in October 2014.

Country	Menkhoff and Miethe (2019)	Hines and Rice (1994)	Consensus list
Andorra	x	x	
Anguilla	x	x	
Antigua and Barbuda	x	x	x
Aruba	x		
Austria	x		
Bahamas	x	x	x
Bahrain	x	x	x
Barbados	x	x	x
Belgium	x		
Belize	x	x	x
Bermuda	x	x	x
British Virgin Islands	x	x	x
Cayman Islands	x	x	x
Chile	x		
Cook Islands	x	x	x
Costa Rica	x		
Curaçao	x	x	x
Cyprus	x	x	x
Dominica	x	x	
Gibraltar	x	x	x
Grenada	x	x	x
Guernsey	x	x	x
Hong Kong SAR China	x	x	x
Ireland	x	x	
Isle of Man	x	x	x
Jersey	x	x	x
Jordan	x	x	
Lebanon	x	x	
Liberia	x	x	x
Liechtenstein	x	x	x
Luxembourg	x	x	x
Macao SAR China	x	x	
Malaysia	x		
Maldives	x	x	
Malta	x	x	
Marshall Islands	x	x	
Mauritius	x		
Monaco	x	x	
Montserrat	x	x	x
Nauru	x		
Netherlands Antilles	x		
Niue	x		
Panama	x	x	x
Samoa	x		
San Marino	x		
Seychelles	x		
Singapore	x	x	x
Sint Maarten	x	x	x
St. Kitts and Nevis	x	x	x
St. Lucia	x	x	
St. Vincent and Grenadines	x	x	x
Switzerland	x	x	x
Tonga	x		
Trinidad and Tobago	x		
Turks and Caicos Islands	x	x	x
U.S. Virgin Islands	x		
Uruguay	x		
Vanuatu	x	x	x

Table A.6: **Lists of Tax Havens used in the Analysis**

Notes: This table shows the list of tax havens we use in our analysis (column (1) [Menkhoff and Miethe \(2019\)](#)) and compares it to the list used by [Hines and Rice \(1994\)](#), which excludes 17 countries categorized as tax havens by [Menkhoff and Miethe \(2019\)](#). Column (3) shows a “consensus” list of tax havens. This list is compiled by [Menkhoff and Miethe \(2019\)](#) by choosing the 29 countries that all appear in most recent studies on tax evasion (see [Menkhoff and Miethe \(2019\)](#), appendix A.2).

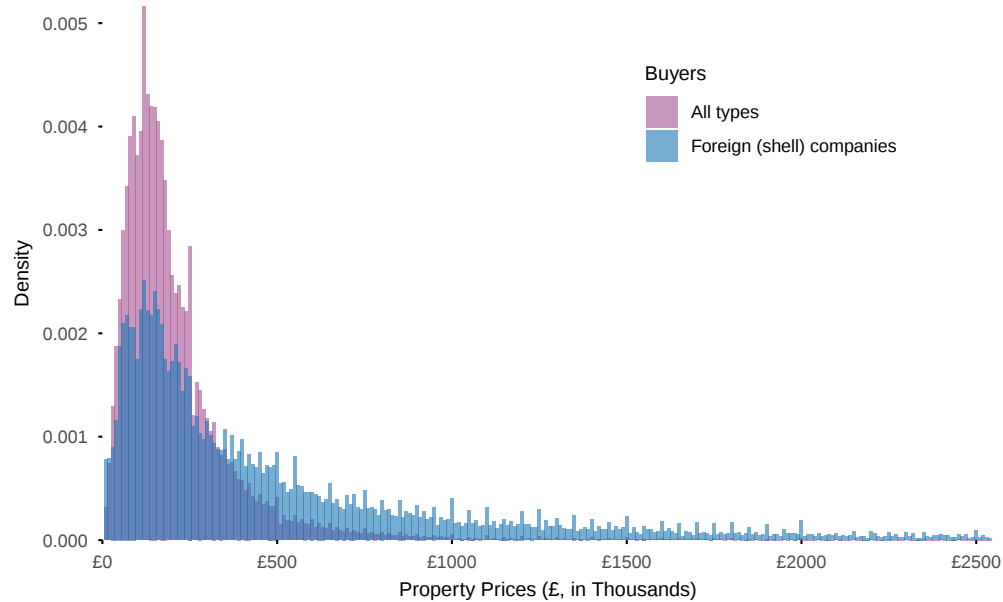


Figure A.1: **Price Distributions - Offshore vs. Total**

Notes: This figure compares the distribution of prices of English and Welsh properties bought through foreign companies (in blue) the distribution of prices of all residential properties bought in England and Wales (in red) over the 2000-2020 period. It is constructed using the Overseas Companies Ownership Dataset, keeping only transactions for which the transaction price is observed, and the Price Paid Data. Both datasets come from the UK Land Registry. For better visibility, the prices are capped at 99.8% of the price distribution of the Price Paid Data.

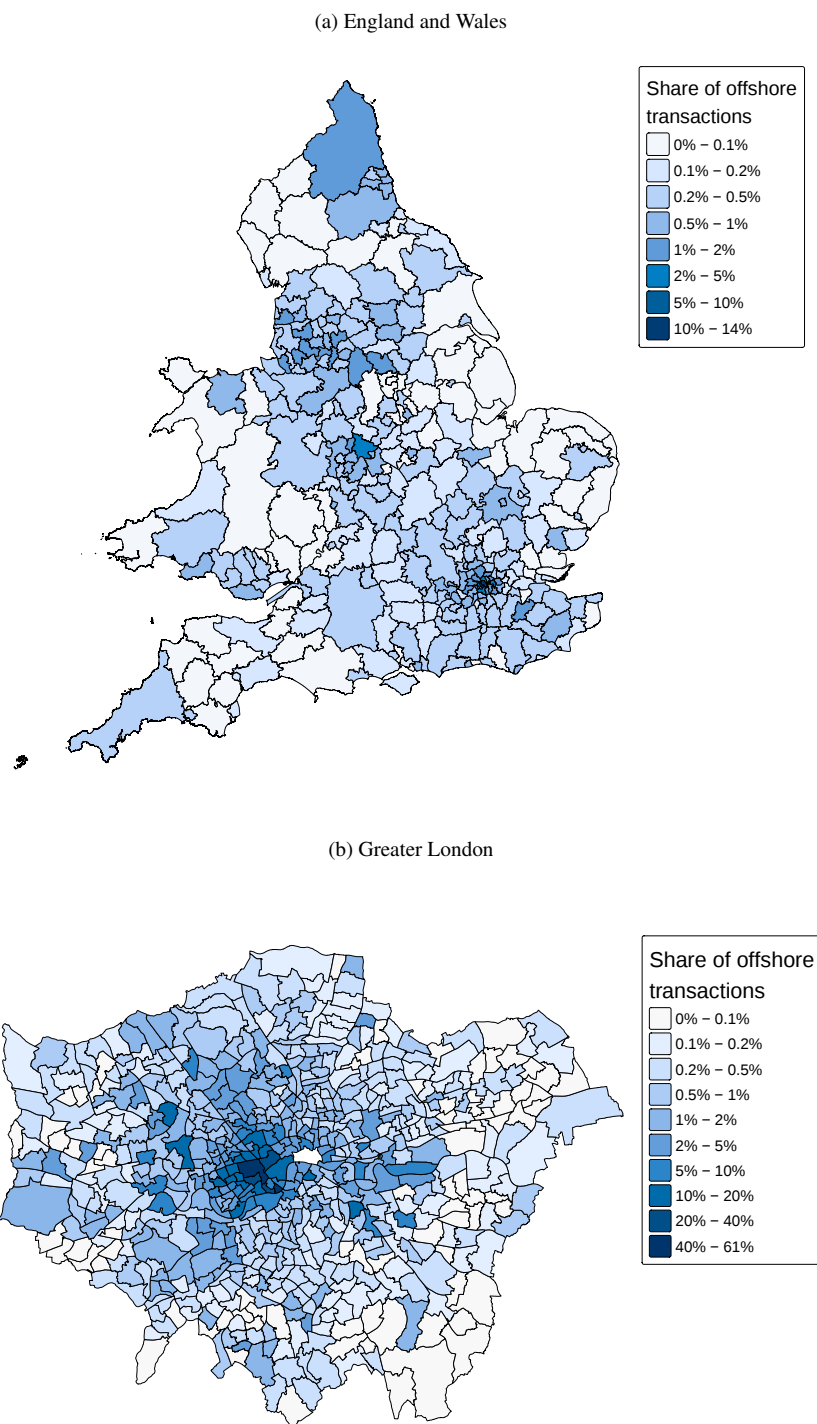


Figure A.2: Share of Residential Purchases from Foreign Companies in Total Residential Purchases

Notes: This figure shows the ratio of residential real estate purchases made by foreign companies in England and Wales over all residential property purchases. Panel A shows this ratio over England and Wales by local authority and Panel B in Greater London only, by ward. This share is computed over the 2000-2019 period. Residential real estate purchases made by foreign companies are identified through the OCOD, while residential purchases are computed using the Price Paid Data. Commercial real estate purchases made by foreign companies are excluded from the sample. The City of London local government is excluded because the Price Paid Data does not provide information on purchases made in the City.

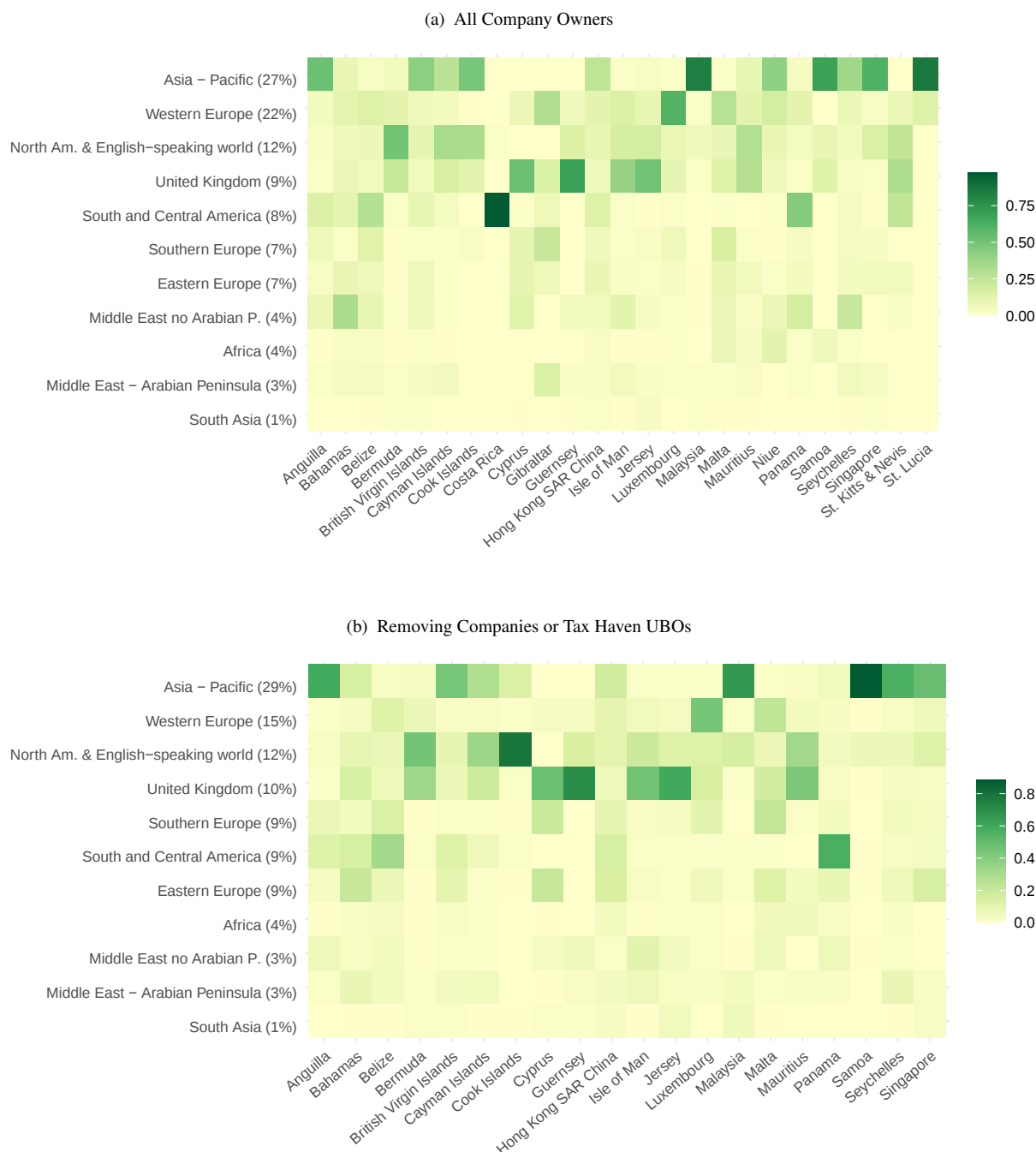


Figure A.3: Heterogenous Use of Tax Havens Across World Regions

Notes: This figure reproduces Figure 1, showing how investors from different world regions choose distinct jurisdictions of incorporation. Each panel is a matrix of ownership shares: for each jurisdiction of incorporation, total ownership is fully allocated across world regions, and the percentages in parentheses give each region's share of company owners in the leaks. Panel (a) includes all jurisdictions used by at least ten company-owner links (rather than the 100 required in Figure 1); Panel (b) shows the same after excluding beneficial owners that are corporate entities or linked to a tax haven. The data come from the Bahamas Leaks, Offshore Leaks, Panama Papers, Pandora Papers, Paradise Papers, CNBIOM data and OpenLux. Totals may not sum to 100% due to rounding.

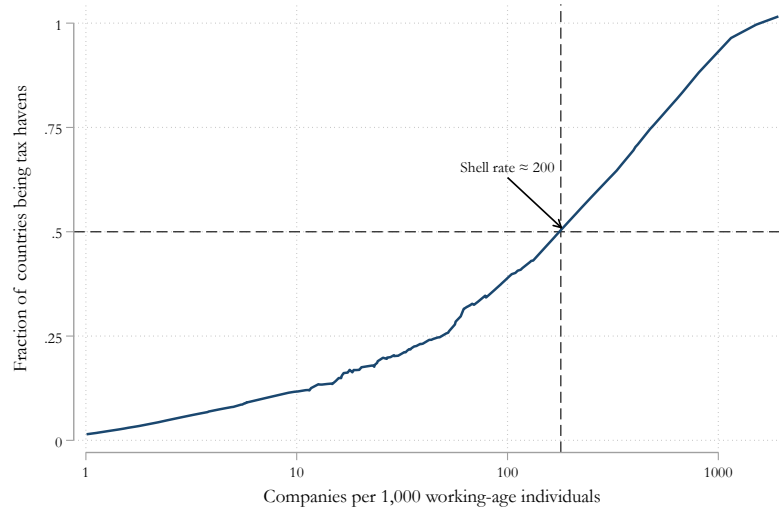


Figure A.4: Shell Rate and Tax Haven Status

Notes: This Figure plots the share of jurisdictions classified as tax havens as a function of their shell-company prevalence. Shell-company prevalence (the “shell rate”) is the number of registered companies per 1,000 working-age individuals, from [Aliprandi, Busschots and Oliveira \(2023\)](#); tax-haven status follows the list of [Menkhoff and Miethe \(2019\)](#). The solid line is a locally weighted (loess) regression of an indicator for being a tax haven on the (log) shell rate, and the horizontal axis is on a log scale. The dashed lines and the arrow mark the point at which half of the jurisdictions are tax havens, which occurs at roughly 200 companies per 1,000 working-age individuals. The sample comprises the 195 jurisdictions for which a shell rate is available, aggregated to the country level and excluding the United States and Canada, for which the data are only available at the state or province level.

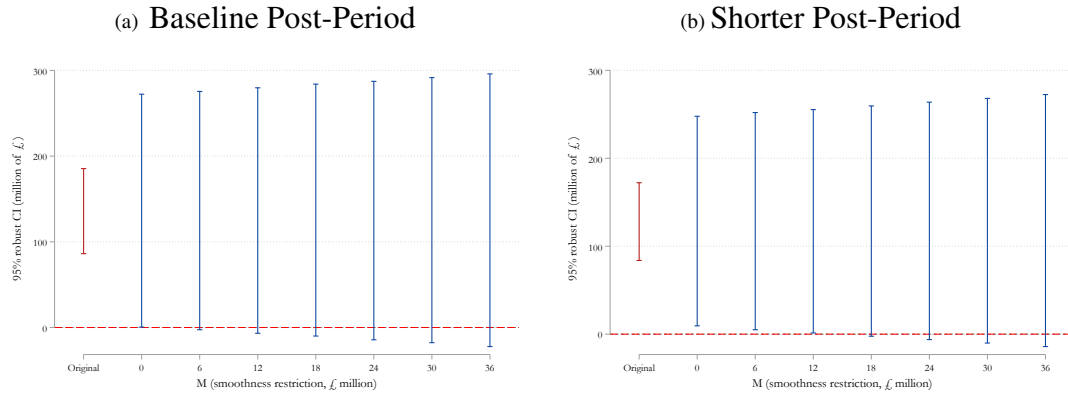


Figure A.5: Sensitivity Analysis to Parallel Trends Violation

Notes: This figure reports the sensitivity of our estimated effect to violations of the parallel-trends assumption, following [Rambachan and Roth \(2023\)](#). The parameter of interest is the pooled post-reform effect of CRS exposure on the value of investment, estimated over our baseline window for the aggregate CRS effect (2013Q3–2016Q4), Panel (a) and over a shorter post-reform period ending in 2015Q4 (Panel (b)). For each panel, we plot the robust 95% confidence interval for this coefficient under the smoothness restriction $\Delta^{SD}(M)$: the differential trend between more and less exposed havens is allowed to depart from a linear extrapolation of the pre-period trend, with the change in its slope between consecutive quarters (its second difference) bounded by M , expressed in £ million. $M = 0$ imposes that any post-reform differential trend is a linear continuation of the pre-trend, while larger values of M permit progressively larger departures from linearity. The grid of M is calibrated to the curvature observed before the reform, extending up to roughly twice the largest second difference of the estimated pre-reform coefficients. Confidence intervals are constructed using the conditional least-favorable (C-LF) method of [Rambachan and Roth \(2023\)](#). Over the baseline window (Panel (a)), the effect remains marginally significant when accounting for a linear pre-trend ($M=0$). Over the shorter window (Panel (b)), the effect remains statistically distinguishable from zero for values of M up to about £12 million.

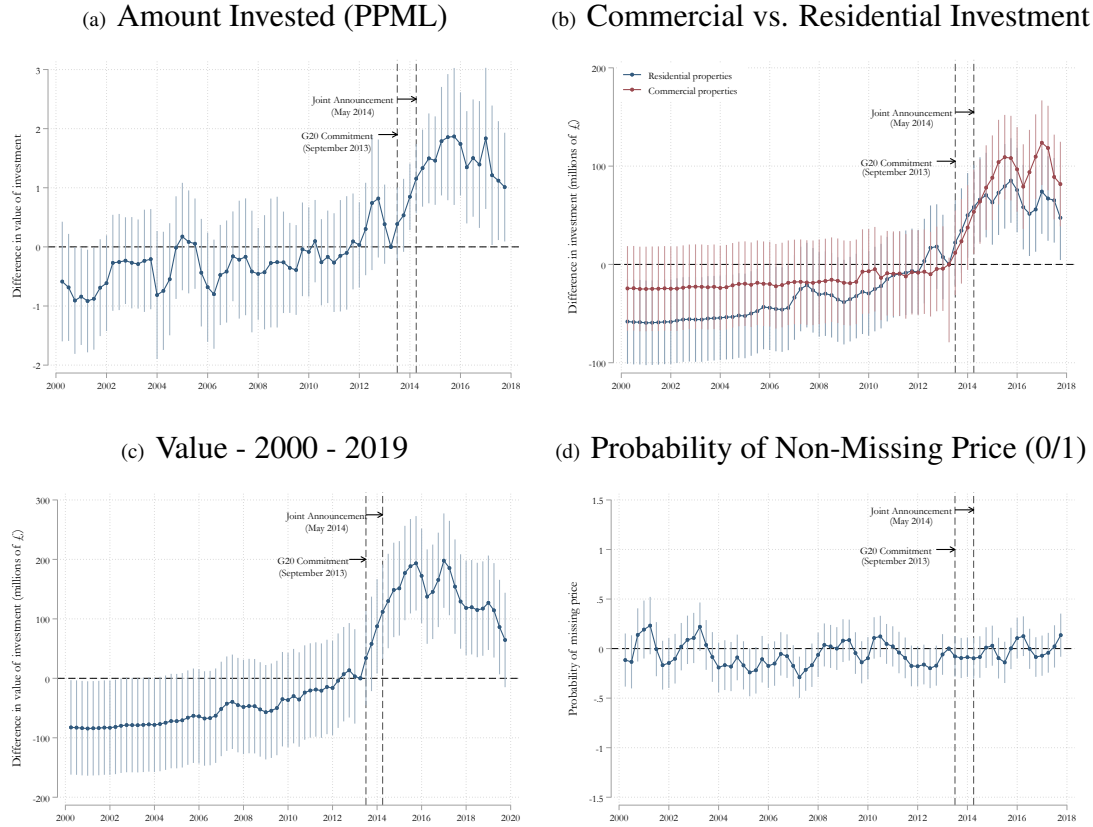


Figure A.6: Difference-in-Differences with Continuous Treatment - Alternative Specifications

Notes: Each panel re-estimates our main event-study specification (equation (2)) under an alternative design. Panel (a) uses PPML rather than OLS; Panel (b) estimates the equation separately for residential and commercial properties; Panel (c) extends the estimation window to the end of 2019; and Panel (d) replaces the outcome with the probability that the transaction price is missing in our full OCOD estimation sample. The treatment is continuous and reflects each tax haven's exposure to the Common Reporting Standard (CRS). The outcome variable is expressed as a three-quarter moving average. The coefficient for 2013q2, the quarter before the CRS commitment, is normalized to zero, so estimates are interpreted relative to the pre-policy baseline. Estimates are based on investments by tax havens in England and Wales, as recorded in the Overseas Companies Ownership Dataset (OCOD). The sample includes 50 tax havens.

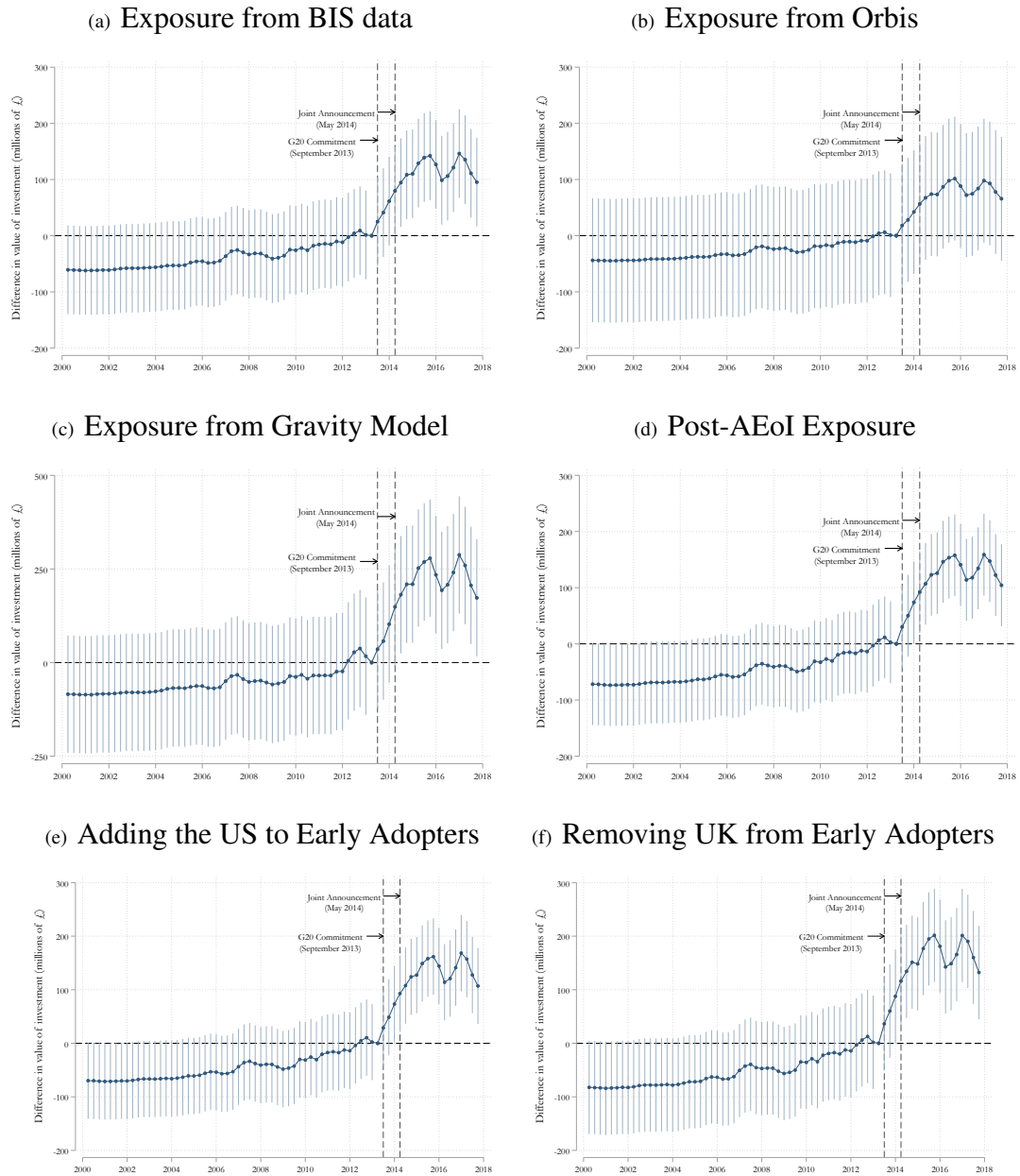


Figure A.7: Difference-in-Differences with Continuous Treatment - Alternative Exposure Measures

Notes: Each panel re-estimates our main event-study specification (equation (2)) using an alternative measure of CRS exposure or definition of the treated group. Panels (a)–(c) replace our baseline leaks-based exposure with a measure built from BIS banking statistics, from Orbis and from the gravity model, respectively (See Appendix Section E for details on how these alternative exposure measures are constructed); Panel (d) uses exposure measured from owners of companies incorporated after 2013Q2; Panel (e) adds the United States to the set of early-adopting countries; and Panel (f) removes UK owners from the construction of the exposure measure. The outcome is the value of investment (in £ million), expressed as a three-quarter moving average; the coefficient for 2013q2, the quarter before the CRS commitment, is normalized to zero. Estimates are based on transactions in England and Wales recorded in the Overseas Companies Ownership Dataset (OCOD).

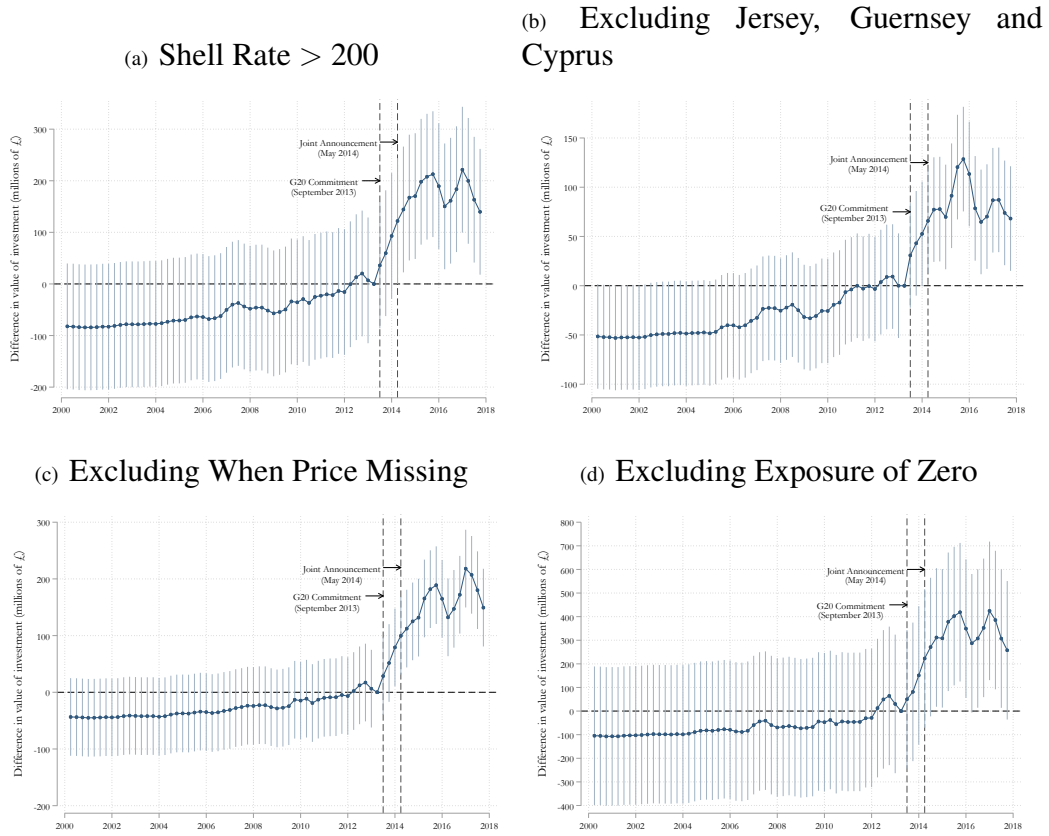
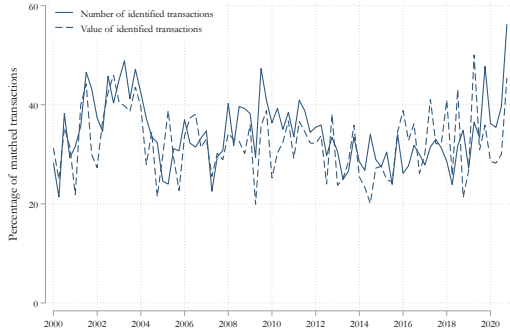


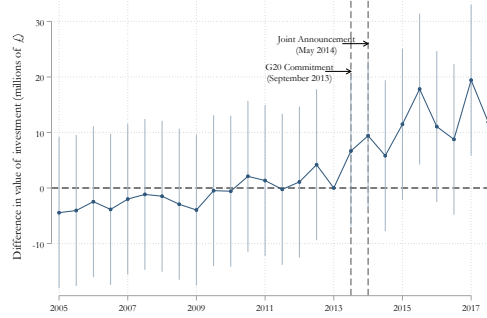
Figure A.8: Difference-in-Differences - Sample Restrictions

Notes: Each panel re-estimates our main event-study specification (equation 2) on a restricted sample. Panel (a) keeps only tax havens with a shell rate above 200 companies per 1,000 working-age individuals or a non-zero exposure measure; Panel (b) excludes the three havens with a high concentration of UK owners (Jersey, Guernsey and Cyprus); Panel (c) excludes transactions for which the price is not directly observed; and Panel (d) excludes havens with a CRS exposure of zero. The outcome is the value of investment (in £ million), expressed as a three-quarter moving average; the coefficient for 2013q2 is normalized to zero. Estimates are based on transactions in England and Wales recorded in the Overseas Companies Ownership Dataset (OCOD).

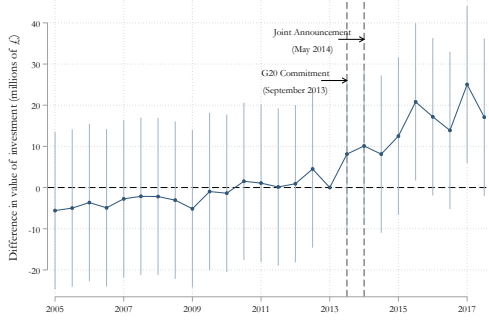
(a) Matching Rate With Leaks and ROE



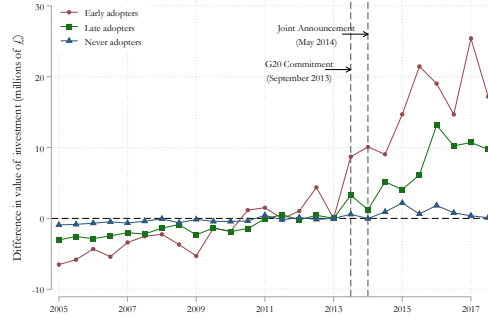
(b) Early vs. Late & Never



(c) Early vs. Never



(d) Early vs. Late vs. Never (Time Series)



(e) Early vs. Never, No UK

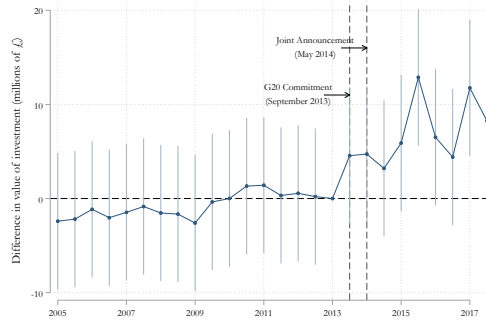


Figure A.9: Difference-in-Differences - Identified Owners

Notes: This figure uses the subsample of OCOD transactions that we match to the beneficial ownership data (the Offshore Leaks, OpenLux, the CNBIOM data and the Register of Overseas Entities), for which we observe the ultimate owner's *country of residence*, rather than only the jurisdiction of incorporation used in our main analysis. Transactions when the ultimate owners is a company are dropped. Panel (a) shows, over time, the share of transactions for which we identify an ultimate owner. Panels (b)–(e) report difference-in-differences estimates of the value of investment by the adoption status of the owner's country of residence, comparing owners who reside in countries that adopted the CRS early with owners who reside in countries that adopted it late and/or never: Panel (b) pools late and never adopters into a single comparison group; Panel (c) compares early with never adopters; Panel (d) reports the three groups separately; and Panel (e) reproduces Panel (c) after excluding owners residing in the United Kingdom. In each panel, the outcome is the value of investment (in millions of £) and the coefficient for the first semester of 2013 is normalized to zero, so that estimates are read relative to the pre-policy baseline. Estimates are based on transactions in England and Wales recorded in the Overseas Companies Ownership Dataset (OCOD).

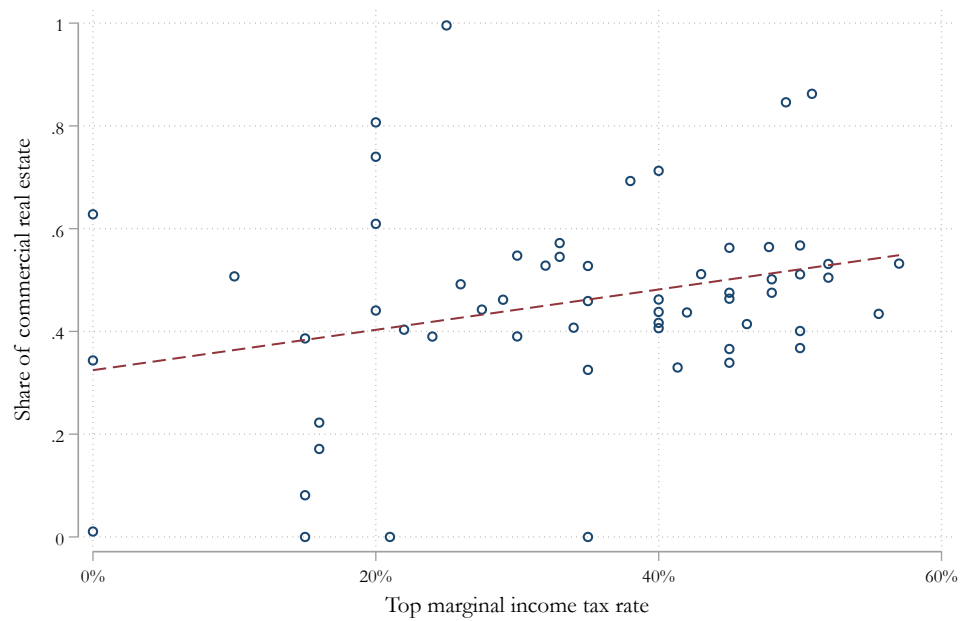


Figure A.10: Tax Rate and Share of Commercial Real Estate

Notes: This figure plots the correlation between a country's tax level and the share of its UK real estate wealth held in commercial properties. The share of UK real estate held in commercial properties is estimated based on the stock of UK properties held through foreign firms for which ownership can be identified from the Leaks data as presented in subsection 5.1. The level of taxation is proxied by the top marginal income tax rate in 2014, taken from the individual income tax rate table built by KPMG and available at <https://home.kpmg/sa/en/home/services/tax/tax-tools-and-resources/tax-rates-online/individual-income-tax-rates-table.html>.

B Processing the OCOD Dataset

The primary data source in our paper is the Overseas Companies Ownership Dataset (OCOD). Making use of this dataset requires heavy data processing work that we detail here.

Obtaining a Dataset at the Transaction Level First, the raw OCOD data is at the stock level, meaning that if a property is bought by a company, for example, *Cyprus Investment Ltd* in April 2013 and sold in September 2019, it will appear as owned by *Cyprus Investment Ltd* in all registers between November 2015 and August 2019. If the property is sold to a UK company or a private individual, it will not appear in the subsequent snapshots. Conversely, if the property is sold to another foreign company, the new entity becomes the designated owner in the OCOD registers from September 2019 onward. While registration is mandatory, there may be a lag between the actual transaction date and its inclusion in the OCOD register because of registration delays. We build a dataset at the transaction level by combining all the stock-level registers.

Parsing Property Addresses If a single buyer purchases multiple properties, the register may list all the properties in the same entry, resulting in nested properties where the address information refers to a group of properties, such as “113, 115, 117 Morning Lane, London (E9 6LH)”. To address this, we use an algorithm developed by [Bourne, Ingianni and McKenzie \(2022\)](#) designed to parse and clean the OCOD dataset. This algorithm transforms the raw data into an enhanced dataset where each observation corresponds to a single property purchased on a specific date. Table [B.1](#) provides an example of the output from this method for highly nested addresses. The table shows how the method enables us to convert a row that corresponds to the purchase of a bundle of properties with multiple nested addresses into multiple rows that each represent a unique address. For instance, in the OCOD data, one of the address entries reads as “flats 1-56, counter house, park street, london (sw6 2fl), flats 1-84, compass house, park street, london (sw6 2fb) and flats 1-143, doulton house, 11 park street, london (sw6 2ft)”. Using the algorithm developed by [Bourne, Ingianni and McKenzie \(2022\)](#), this single address entry can be transformed into 283 distinct addresses, each corresponding to a flat ID located in either Counter House, Compass House, or Doulton House on Park Street, London. However, some addresses in the OCOD data are incomplete and remain so after the data parsing. Thus, we only keep properties where the street name and street number are non-missing, or when the street name and building name are non-missing.

Unit id	unit type	building name	street number	street name	postcode	city
1		counter house		park street	SW6 2FL	london
...		counter house		park street	SW6 2FL	london
56		counter house		park street	SW6 2FL	london
1		compass house		park street	SW6 2FB	london
...		compass house		park street	SW6 2FB	london
84		compass house		park street	SW6 2FB	london
1		doulton house	11	park street	SW6 2FT	london
...		doulton house	11	park street	SW6 2FT	london
143		doulton house	11	park street	SW6 2FT	london

Table B.1: **Example of an Enhanced Address Using Bourne et al. (2022) Algorithm**

Notes: This table displays the outcome of the address parsing process developed by [Bourne, Ingianti and McKenzie \(2022\)](#) and adapted for our dataset. The parsing process converts a single, composite address: “flats 1-56, counter house, park street, london (sw6 2fl), flats 1-84, compass house, park street, london (sw6 2fb) and flats 1-143, doulton house, 11 park street, london (sw6 2ft)” into 283 unique addresses.

Importantly, we exclude from our analysis instances where a single proprietor purchases more than 100 properties on the same date, removing about 39,000 transactions from our sample. This is because although it is mandatory for buyers to register their purchases with the Land Registry, there is no formal time limit to do so. Therefore, we suspect that some highly-active buyers register their purchases in bulk, even though they happened on different dates. Excluding these transactions enhances the reliability of our final dataset, but our results are robust to this sample restriction.

Classifying Properties The OCOD register does not contain information on the type of properties owned, such as whether a property is residential, commercial, or a piece of land. We use the same property type classification method as the one developed in [Bourne, Ingianti and McKenzie \(2022\)](#). Their method is described in their [appendix](#) and can be summarized as follows: a property will be classified as “business” if the address contains keywords related to business (such as “shop” or “restaurant”), if the property is matched (on street number, street name and district) to the Valuation Office Agency (VOA) rating list (which is used by local councils to charge business rates),⁴³ or if there is a business located in the same building. A property is classified as “residential” if its address contains keywords related

⁴³Business rates are a tax charged on most non-domestic properties. This typically includes shops, offices, pubs, warehouses, factories, holiday rental homes or guest houses.

to domestic properties (such as “flat” or “apartment”), if there are no businesses in the same geographic area (Output Area or Lower Layer Super Output Area), or if there is a match with the Price Paid Data. This classification method is hierarchical, which means that if two different rules leading to conflicting property types are satisfied by a property, the rule that comes first takes precedence and the property is classified accordingly.

Using this method, the OCOD properties are classified into five categories: land (10%), parking spaces (2%), air spaces (1%), residential (71%) and commercial (15%). 1% of the property types remain unknown. To focus our analysis on the effects of tax transparency on real estate markets, we only keep in our sample residential and commercial properties.

Inferring Missing Prices Approximately 70% of the transactions in the dataset do not include information on the price paid. This can happen for several reasons. First, HM Land Registry only started collecting price data for transactions involving non-private buyers from October 2013.⁴⁴ Second, companies often purchase portfolios of properties and if the price paid for each individual property is not specified in the transaction document,⁴⁵ the Land Registry excludes the price information from the register. To recover missing price information, we follow [Johannesen, Miethe and Weishaar \(2022\)](#) and make use of another dataset managed by the Land Registry, the Price Paid Data (PPD). We predict the price of the remaining 47% of the purchases using the sample of transactions where the price is available.

Complementing the OCOD Dataset With the PPD Dataset: The PPD provides details on the majority of residential and some non-residential property purchases in the UK since 1995, including price, address and transaction date. After standardizing address information in both datasets, we match the OCOD to the PPD using the property’s address and postcode.

Several attempts to match the Price Paid Data to the Overseas Companies Ownership Dataset have been made before us (see [Bourne, Ingiani and McKenzie \(2022\)](#); [Johannesen, Miethe and Weishaar \(2022\)](#)). Our own attempt is similar to what was done in [Johannesen, Miethe and Weishaar \(2022\)](#). Specifically, we focus on properties for which postcode information is available. We first match on simple addresses (street number, street name and postcode). Then, we add properties where some information on the unit type (typically “flat”) and unit number is available. It is important to note that transactions involving a corporate buyer do not appear in the Price Paid Data before October 2013. Therefore, for all OCOD transactions that occurred before that date, a match is possible only if the same property was traded either before by a private individual or later by any kind of buyer. In this case, the date of the transaction appearing in both datasets will be very different. Contrary to [Johannesen, Miethe and Weishaar \(2022\)](#), we decide to keep these matches⁴⁶ and to use the price information from the Price Paid Data, and adjust for within-district house

⁴⁴For some transactions happening before that date the price information can be non-missing if the applications were lodged for registration to the Land Registry after 2013.

⁴⁵Form TR5: Transfer of a portfolio of titles (whole or part).

⁴⁶[Johannesen, Miethe and Weishaar \(2022\)](#) exclude matches when the transaction date as registered in OCOD and in PPD is more than four

price inflation between the two dates of purchase. We were able to match 49% of the OCOD transactions to a Price Paid Data transaction when restricting the sample to properties classified as residential and where the postcode information was not missing.

Several reasons can explain why the match between the PPD and OCOD is not 100%. First, before Oct. 2013, if the buyer is a firm, the sale does not appear in the Price Paid Data. Thus, if a property is purchased by a company before Oct. 2013, the property appears in the Price Paid Data only if it has been purchased before⁴⁷ by a private individual or if there is a new transaction for this property later on. This condition therefore excludes potentially many properties we observe in OCOD from the Price Paid Data.⁴⁸ Then, the Price Paid Data gathers information mostly on residential properties, even though some non-residential properties also appear in the data set. Therefore, most commercial properties appearing in the OCOD are likely to have no match in the PPD. Finally, even after 2013, there are a number of exclusions from the price paid data set, including, among others, some cases where a portfolio of properties is transferred.⁴⁹

Prediction of the remaining missing prices: 47% of the OCOD estimation sample has missing price information, either because the information is missing in the OCOD dataset or because the property does not match to any property in the Price Paid Data. We predict missing prices using the sample of transactions where the price is available. Properties situated in the city of London are excluded as we lack any precise price information for this area. Let us denote by Z_i a set of properties' characteristics that we observe in our sample. We can express the properties' (log) prices as

$$p_i = \beta Z_i + \epsilon_i \quad (5)$$

Where ϵ_i is the price component not captured by the set of predictors that we assume to be orthogonal to Z_i . Prices are winsorized at the 95% level in order to be conservative when predicting property prices.⁵⁰

We estimate β from equation (5) using the subsample where the price is indicated, and the missing prices are then predicted using the resulting $\hat{\beta}$ as

$$\hat{p}_i = \hat{\beta} Z_i \quad (6)$$

The prediction model is estimated by OLS. The set of predictors includes the property tenure (leasehold, freehold),

months apart.

⁴⁷but after 1995, when the Price Paid Data starts.

⁴⁸For transactions happening before Oct. 2013 that still match a PPD transaction (because the same property is traded later or before by a private individual), we still use the price information appearing in the Price Paid Data. In this case, the date of transaction recorded in the OCOD and Price Paid Data will be different and so we adjust for within district house price inflation between the two dates of purchase.

⁴⁹“Vesting Deeds Transmissions or Assents of more than one property”.

⁵⁰The paper's estimates of the rebalancing are robust to the level of price winsorization: Table 2 shows that the estimated response to the AEoI is very similar whether we restrict the sample to transactions with observed prices or use the baseline sample including inferred prices.

a postcode fixed effect,⁵¹ a quarter fixed effect, a dummy variable for residential, a Greater London dummy and a dummy for expensive districts. Using the Price Paid Data, we also include as predictors for each property the number of sales that occurred in the same postcode area and the average price.⁵² The $\hat{\beta}$ are estimated on a training sample composed of 80% of the transactions, and the quality of the predictions is evaluated with a test sample built with the 20% remaining observations. We obtain an out-of-sample R^2 of 0.71, a root mean square error (RMSE) of 0.79 and a mean absolute error (MAE) of 0.48.

In figure B.1b, we plot the predicted against the observed price in log for each transaction from the test sample. The smaller the distance between a point and the 45 degree line, the better the prediction. The figure shows that while some points are well above or below the 45 degree line, there is no evidence of systematic over- or underestimation of the true prices.

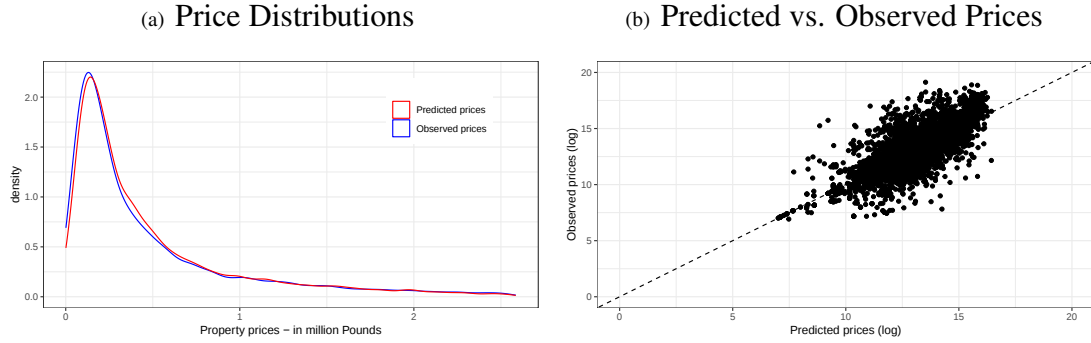


Figure B.1: Quality of the Predictions of Transaction Prices

Notes: Panel a) displays the distribution of observed and predicted prices in the test sample. This sample is selected by randomly picking 20% of the transactions for which we have price information. It is not used to estimate equation (5) but only to test the quality of our price prediction. For better visibility, we cut the distribution at the 90th percentile. In panel b), the scatterplot displays the predicted against observed prices (in log) in the test sample, depending on whether we have information on the property size or not. If a point lies on the 45 degree line, it means that the predicted and observed prices correspond exactly.

⁵¹When we observe less than 6 transactions in a given postcode, we use a higher level of aggregation, until at least 6 transactions are observed in the considered area. We start by “output area”, then use “middle layer super output area” and finally “district”.

⁵²In case the postcode x quarter of a given transaction in the OCOD data does not match to any transactions in the Price Paid data, we use information on average price by district/local authority, which is a greater level of aggregation.

C Processing the Beneficial Ownership Data

We process each beneficial ownership source into a harmonized table that links a company, identified by its name and country of incorporation, to its ultimate beneficial owner (UBO) and to the UBO’s country. The sources we use, described in section 3.2, are the ICIJ Offshore Leaks (the Offshore Leaks, the Panama Papers, the Paradise Papers and the Pandora Papers), the OpenLux and CNBIOM data and the Register of Overseas Entities (ROE). Section C.3 presents the methodological choices implemented on the ownership data when constructing the CRS exposure measure.

C.1 Corporate Ownership Datasets

Name and jurisdiction standardization. We convert names to upper case, remove punctuation and harmonize common abbreviations (for instance “LTD” becomes “LIMITED”, “CORP” becomes “CORPORATION”, “INC” becomes “INCORPORATED” and “CO” becomes “COMPANY”). We similarly normalize the country of incorporation, consolidating sub-national jurisdictions (e.g. US states are mapped to the United States).

Resolving ownership chains. A company is often owned not by an individual but by another company. When this is the case, we look up that intermediate company in the same data and retrieve its own owners, and we repeat this operation three times until we reach an individual or run out of information. At each step we keep the deepest owner we can identify, which we treat as the “true” UBO of the original company.

Identifying companies appearing as beneficial owner. We classify each resolved UBO as an individual or a company. In particular, we flag as a company any owner whose name contains a corporate keyword (such as “LIMITED”, “CORPORATION”, “TRUST”, “HOLDING” or “FUND”).

Ownership weights. When a company has n owners, we split its shares equally and assign a weight of $\frac{1}{n}$ to each. When ownership is traced through several layers, these fractions are multiplied along the chain, and we renormalize the weights so that they sum to one for each company. Whenever an owner reports more than one nationality, the corresponding share is again split equally across them.

C.2 The Register of Overseas Entities

The Register of Overseas Entities requires a few additional steps, which we detail here. Introduced in 2022, the Register requires every overseas entity that owns UK property to disclose its beneficial owners, and these disclosures are published as part of the Companies House “People with Significant Control” (PSC) register. We therefore start

from the full PSC snapshot, restrict it to companies incorporated outside the United Kingdom and keep their declared beneficial owners.⁵³

Country of residence. For each beneficial owner, the Register reports both a correspondence address and a nationality. We use the correspondence address to determine the country of residence, with one exception: when the address is located in a tax haven, we instead assign the owner to the country of their nationality.⁵⁴ We do so because owners may report the address of an intermediary rather than their own residence.

Nominees and corporate service providers. For the same reason, we flag likely nominees and corporate service providers and remove them from the data. We identify them as correspondence addresses shared by more than nine distinct beneficial owners, or as identical owner names declared as beneficial owner of more than nine different companies.

Corporate ownership chains. A declared beneficial owner is frequently another company. We resolve these chains in two complementary ways. First, when an owner is another overseas company present in the Register, we retrieve that company's own owners, iterating up to six times. Second, when an owner is a UK company, we retrieve its beneficial owners from the UK PSC register, iterating up to ten times.⁵⁵ As for the other sources, at each layer we split ownership equally across the identified owners and multiply these fractions along the chain, keeping the deepest owner we can identify as the UBO.

C.3 Corporate Ownership Data Used for the CRS Exposure Measure

The CRS exposure measure is built from the ownership links in the Offshore Leaks, OpenLux and CNBIOM data. We make two adjustments to the data presented in Section C.1 and C.2. First, we drop ownership links whose identified beneficial owner is itself a company. Second, we reallocate owners linked to a haven to their most probable country of residence. We do so by leveraging the Register of Overseas Entities, which reports the nationality of UK property owners in addition to their correspondence address; this lets us observe the residence–nationality relationship for owners whose residence country is a tax haven. For each haven, we measure in the Register the nationality composition of the owners whose correspondence address is in that haven, and we split the ownership initially attributed to that haven in the leaks according to these same proportions. For example, if 30% of the owners with a Swiss correspondence address in the Register are French nationals, we reallocate 30% of the ownership initially located in Switzerland to

⁵³We identify overseas companies from the Companies House register and drop those incorporated in the United Kingdom.

⁵⁴We apply a few additional rules: for instance, owners whose declared nationality and address country coincide are assigned to that country, and UK nationals reporting an address in Scotland, Wales or Northern Ireland are assigned to the United Kingdom. Nationalities are converted to countries using a standard nationality-to-country lookup.

⁵⁵UK companies are matched on their Companies House registration number, which we standardize to an eight-character format.

France, and we repeat this for every haven and every nationality.⁵⁶ Figure F.4b shows how this reallocation affects the geographical distribution of ownership for UK properties held by foreign companies in 2018. Importantly, as shown in Appendix Table A.4, our estimated aggregate response to the AEoI is barely affected by how we treat these ownership links: whether we keep all of them, drop only beneficial owners that are companies incorporated in a tax haven, or drop every owner (company or individual) linked to a tax haven.

D Matching Between OCOD Dataset and Beneficial Ownership Data

To learn more about the beneficial owners of UK properties, we match the OCOD data to the beneficial ownership data, namely to the Leaks, the OpenLux, the CNBIOM data and the Register of Overseas Entities, which we processed following the steps described in Appendix Section C. The outcome of the matching procedure is presented in Table A.2. The matching proceeds in several steps:

1. We match each OCOD company to the beneficial ownership data on its standardized name and we keep a match only when the country of incorporation is the same in both datasets.
2. For the leaks, the OpenLux and the CNBIOM data, we keep only matches for which the company was active at the time of the purchase, that is, incorporated before the purchase and with the ownership link still valid, allowing a 90-day window around the purchase date.⁵⁷
3. When the same property is matched through more than one source, we keep a single record in order to avoid counting it twice.
4. Each matched company comes with its ultimate beneficial owner(s) and their shares, identified as described in Appendix Section C: a company owned by n identified owners contributes a $\frac{1}{n}$ share to each. We renormalize these shares so that they sum to one for each matched company.
5. When the identified ultimate owner appears as resident from a tax haven, we predict the true residence country following the method described in Section C.3.

⁵⁶This amounts to assuming that, within a given tax haven, the owners appearing in the leaks have the same nationality distribution as those observed in the Register.

⁵⁷We have access to the companies' incorporation and status dates and to the validity dates of the ownership links, for these three sources. The Register of Overseas Entities does not provide comparable information, so we do not apply this restriction to it. Moreover, this piece of information is sometimes missing in the leaks, the OpenLux and the CNBIOM data too, in which cases we don't apply this filter.

E Building Alternative CRS Exposure Measures

This section presents the method used to construct our three alternative CRS exposure measures. Figure E.2 compares all three exposure measures to our baseline.

Exposure based on BIS data We build a BIS-based exposure measure from the BIS Locational Banking Statistics, which report bilateral cross-border bank positions. For each tax haven, we take the cross-border deposits held in its banks by non-bank counterparties as of the second quarter of 2013, broken down by the country of the depositor, and compute the share coming from residents of early-adopting countries.⁵⁸ Where a tax haven does not report to the BIS, we fall back on the leaks-based measure.

Exposure based on Orbis data Our second alternative exposure measure leverages the Orbis database. For every company incorporated in a tax haven, Orbis reports its registered beneficial owners and their country of residence. We split each company's ownership equally across its beneficial owners and, aggregating by country of incorporation, compute for each haven the share of ownership attributable to residents of early-adopting countries—the Orbis-based counterpart of our baseline measure. Importantly, similarly to what we see in the Leaks, a number of beneficial owners appear as residents from tax havens. When this is the case, we proceed similarly to what we do for the leaks data and predict the most likely true residence country of the owner (see Appendix Section C.3 for details).

Exposure based on a gravity method Some tax havens appear rarely or not at all in the leaks, leading us to assign them a CRS exposure of zero. As an alternative, we propose to predict all tax havens' CRS exposure using a gravity model. In particular, we first estimate a gravity equation on the ownership links observed in the Leaks, relating the number of owners from a given country to standard bilateral characteristics such as distance, common language and colonial ties. We then use the estimated coefficients to predict the country composition of owners for havens that do not appear in the Leaks, from which we recover their CRS exposure.

We take bilateral gravity covariates for 2013 from the CEPII Gravity database: geographic distance, common official language, past colonial link, contiguity, common legal origin and the GDP and population of both the haven and the owner country. We complement CEPII with World Bank 2013 GDP and population for small territories it omits, and a short manually compiled file for a few jurisdictions absent from both (e.g. the British Virgin Islands, Gibraltar, Anguilla, Montserrat and the Channel Islands). The Crown Dependencies (Jersey, Guernsey, the Isle of Man), which CEPII does not cover, are assigned the United Kingdom's bilateral values, since they lie just off the British coast and share its language, common-law legal origin and dependency status. The observed country-of-origin composition of owners is taken from the same leaks and OpenLux data used for our baseline measure.

⁵⁸We use total liabilities to non-banks, all currencies, cross-border positions, with the haven as the reporting country and the depositor's residence as the counterparty country.

Then, for each haven observed in the leaks (with at least ten owners), we compute the share of its owners coming from each country. We regress these shares on the bilateral gravity covariates, together with owner-country fixed effects and haven sub-region dummies, by Poisson pseudo-maximum-likelihood. We use the estimated model to predict the country-of-origin distribution for the havens missing from the leaks and define the gravity-based CRS exposure as the predicted share of owners residing in early-adopting countries. Figure E.1 plots, for each haven in the leaks, the predicted against the observed CRS exposure.⁵⁹ While predicted exposures are, on average, slightly lower than observed ones, the points lie remarkably close to the 45-degree line, suggesting that this method predicts CRS exposure with reasonable accuracy.

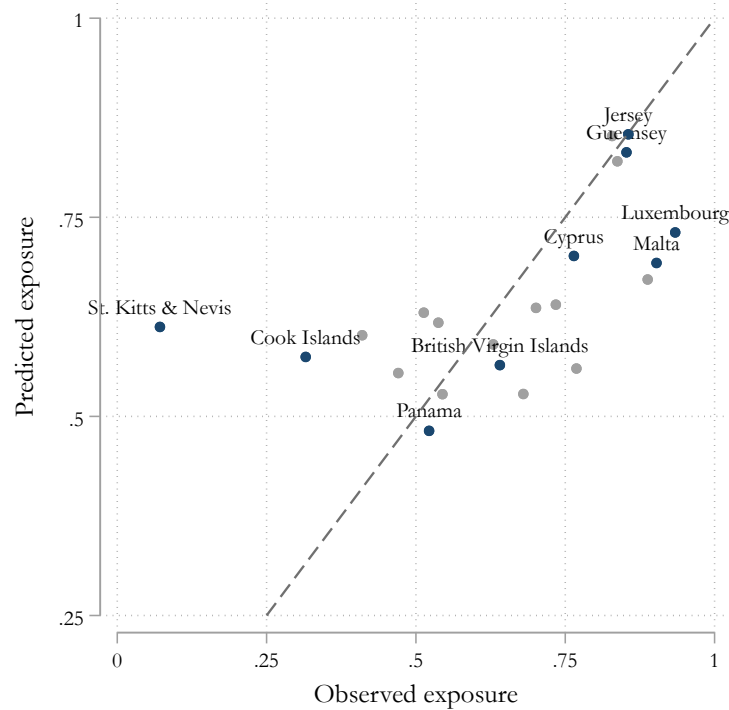


Figure E.1: **Quality of CRS Exposure Prediction from Gravity Model**

Notes: This figure shows, for the tax havens appearing in the Leaks, the predicted CRS exposure measure obtained from the estimation of a gravity equation and compares it to the actual observed exposure. Each point is a tax haven: the horizontal axis reports the observed (leaks-based) exposure and the vertical axis the gravity-predicted exposure, and the dashed line is the 45-degree line along which the two coincide. A haven's exposure is the share of its owners residing in early-adopting countries. Predicted values are obtained by leave-one-out cross-validation: for each haven, we re-estimate the gravity model on all other havens and use it to predict that haven's exposure. The gravity equation is a Poisson pseudo-maximum-likelihood regression of the share of owners coming from each country on standard bilateral gravity covariates (geographic distance, common official language, past colonial link, contiguity, common legal origin and the GDP and GDP per capita of both the haven and the owner country, from the CEPII Gravity database) together with owner-country fixed effects and haven sub-region dummies.

⁵⁹Predicted exposures for havens in the leaks are obtained by leave-one-out cross-validation: we drop each observed haven in turn and predict its exposure from the others.

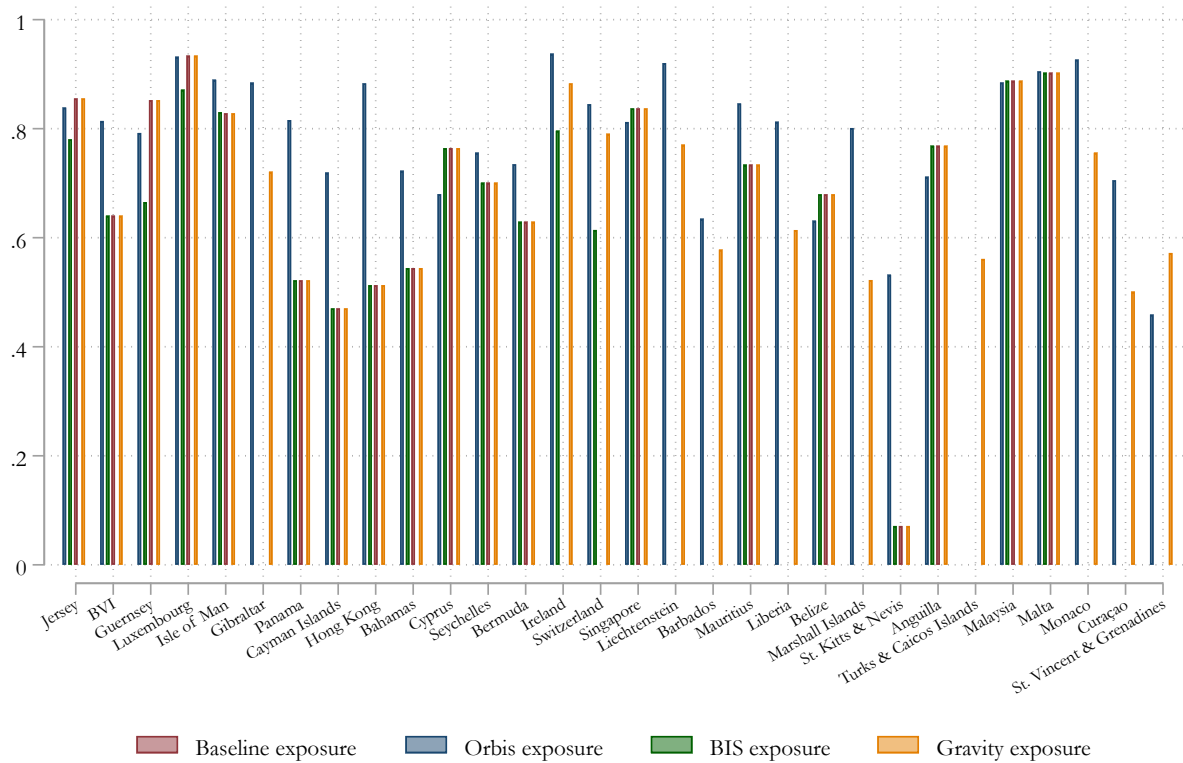


Figure E.2: **Distribution of CRS Exposure Measures Amongst the Top 30 Tax Havens**

Notes: This figure shows the distribution of alternative exposure measures to the Common Reporting Standard for the 30 tax havens that channel the most UK real estate investment. Each time, exposure to the CRS is defined as the share of investors in a jurisdiction affected by the CRS.

F Offshore Real Estate Wealth in 2018

Offshore real estate is a blind spot in international tax transparency today. This section presents descriptive evidence on the scale, the composition and the ownership of offshore real estate in the United Kingdom as of 2018. Section F.1 presents the additional data not already presented in the main text, Section F.2 presents the results and Section F.3 provides additional methodological steps.

F.1 Data

F.1.1 Estimates of Real Estate Wealth Owned in England and Wales

Estimates presented in section 3.3 combine data on foreign ownership of real estate with estimates of the UK national balance sheet in 2018.⁶⁰ We compute total real estate wealth in England and Wales as the sum of residential and commercial real estate owned by (domestic + foreign) households and corporations.⁶¹ We proceed in three steps. First, we compute the value of total commercial and residential wealth for the UK as a whole. Residential real estate wealth is simply the sum of the value of “dwellings” and “land underlying dwellings”.⁶² Commercial real estate is approximated in our paper by the category “other buildings” from the National Accounts.⁶³ Other buildings consist in fact of all buildings that are not dwellings and include commercial buildings, industrial buildings and buildings used to provide public services.⁶⁴ Since we ultimately discard properties owned by the government, the latter category is likely to be marginal in our estimates. However, our definition of commercial real estate will include some industrial properties (such as warehouses) and should therefore be considered as an upper bound for commercial real estate wealth. The ONS provides estimates of land underlying other buildings and structures. We allocate the value of land underlying other buildings proportionally to the value of other buildings relative to the total of other buildings and structures.⁶⁵

Then, following Johannesen, Miethe and Weishaar (2022), we scale our estimates by the land share of England and Wales (61.7%) in order to obtain estimates of the value of residential and commercial properties owned in England and Wales. Finally, the national accounts statistics provide information on who owns the assets (households, corporations, government), but the estimates for the value of the land owned are aggregated, thus the distinction between the value of the land underlying dwellings and underlying other buildings is not provided. In order to estimate how much is owned by households and (private) corporations only (thus discarding assets owned by the government or non-profit),

⁶⁰National balance sheet estimates can be found [here](#).

⁶¹Correspondence with the ONS taught us that UK real estate wealth owned by non-residents is included in the UK national balance sheet.

⁶²The ONS provides details on the value of land underlying dwellings and land underlying other buildings and structures [here](#).

⁶³System of National Accounts 2008 gives some examples of other buildings: they can refer to “warehouses and industrial buildings, commercial buildings, buildings for public entertainment, hotels, restaurants, schools, hospitals, prisons etc.”.

⁶⁴Source: [here](#).

⁶⁵Note that by doing so, we are somewhat underestimating land underlying buildings (relative to structures) since buildings are likely located in areas where the land has a higher value.

we allocate the total value (buildings + land) obtained for the whole economy proportionally to the value of dwellings and other buildings owned by households and corporations in the total for all sectors, respectively.

F.1.2 Direct Ownership of UK Real Estate

While this paper mostly focuses on corporate ownership of properties, foreign investors may also purchase UK real estate directly rather than through a corporate structure. To capture these holdings, we use data on direct foreign ownership obtained by the Centre for Public Data (CFPD).⁶⁶ It provides information on the number of property titles held in England and Wales by individuals with an overseas correspondence address, by local geographic areas. It consists of snapshots available every two years between January 2010 and January 2020 (with a final snapshot in August 2021).

The last snapshot reveals that more than 180,000 properties were registered by individuals with an overseas correspondence address, which represents 0.7% of all registered titles in England and Wales.⁶⁷ This figure has more than doubled since 2010 and now surpasses the number of properties owned by foreign companies. It thus constitutes a very important element of the UK offshore real estate market. Unfortunately, the data provides no information on the properties' value. Thus, we estimate the price of each property based on the average price of residential properties in the district at the time of the snapshot, using data from the Office for National Statistics. Given that foreign owners are likely to buy more expensive properties than the average, even after controlling for location, our estimates of the value of direct ownership of properties from abroad are likely to be conservative.

F.2 Results

F.2.1 Scale

In this paper, we define offshore real estate as real estate held by foreign individuals or through foreign entities. By combining data on UK properties held by foreign entities and foreign individuals in January 2018, we estimate that around \$260 billion worth of real estate in England and Wales was owned from abroad at that time. This figure comes from around 90,000 properties held by foreign entities and about 150,000 titles owned by individuals with a foreign address.⁶⁸

How large are these numbers relative to the UK property market as a whole? To answer this question, we construct estimates of total real estate wealth owned by corporations and households in the UK based on national balance sheet estimates published by the Office for National Statistics (ONS). These national accounts statistics provide information

⁶⁶The data is accessible at <https://www.centreforpublicdata.org/property-data-overseas-individuals>.

⁶⁷"New data on property in England and Wales owned by overseas individuals", Centre for Public Data analysis, November 2021, last consulted on July 15, 2023.

⁶⁸The characteristics of 90,000 properties held by foreign entities in 2018 are comparable to that of the average property purchased over the period 2000-2020 (see Appendix table 1 for a comparison).

on the net worth of assets owned in the UK by type of asset and category of owner. We build estimates of total residential and commercial real estate owned both directly and through corporations in England and Wales in 2018.⁶⁹ The detailed methodology is provided in section F.1.1.

Figure F.1a shows the size of the real estate market in England and Wales by type of ownership (corporate, direct and total) and displays the share held from abroad. In total, we estimate that the aggregate value of real estate owned by individuals and private corporations in England and Wales in 2018 was around \$6,000 billion. 75% of this wealth is held directly, i.e. by households, while the rest is held by corporations. We estimate that the \$260 billion worth of real estate held from abroad represent around 4% of the stock of properties owned in England and Wales at this time. About 60% of this real estate wealth is held through foreign corporations, while 40% is held directly by individuals with a foreign correspondence address. The share of foreign ownership is also significantly higher for corporate ownership than for properties held by households (11% vs. 2%). Appendix figure F.1b breaks down real estate wealth in England and Wales by type of property. Residential real estate wealth is estimated to lie around \$5,270 billion in total in 2018, 15% of which being held by foreign and domestic corporations. The commercial real estate market is much smaller, totaling \$730 billion, with 96% of it owned by corporations.

To the best of our knowledge, our study is the first to estimate the overall size of the offshore real estate market in the UK, accounting for both residential and commercial property and for both direct and corporate ownership. Two prior studies estimate the value of residential property (excluding commercial) held by foreign corporations: [Johannesen, Miethe and Weishaar \(2022\)](#) for England and Wales (December 2019) and [Bourne, Ingiani and McKenzie \(2022\)](#) for London alone (January 2022). Figure F.1c compares their estimates with ours for this same market segment. The magnitudes are broadly comparable across all three studies. Our estimate for England and Wales exceeds that of [Johannesen, Miethe and Weishaar \(2022\)](#) (USD 110 billion vs. USD 70 billion), a gap driven mainly by how properties are classified as residential: [Johannesen, Miethe and Weishaar \(2022\)](#) apply a more conservative rule.⁷⁰ For housing wealth held in London, our estimate is close to [Bourne, Ingiani and McKenzie \(2022\)](#) (USD 84 billion in our study compared to USD 76 billion according to [Bourne, Ingiani and McKenzie \(2022\)](#)). Although a degree of uncertainty remains, the three studies yield comparable figures and confirm that our estimated order of magnitude is likely correct.

The overall size of the global offshore real estate market remains uncertain, despite increasing evidence of its importance. Figure F.1d compares our estimates for England and Wales to studies focusing on other locations. In the global cross-border real estate market, the United Kingdom, as proxied by England and Wales, stands out due to its substantial size. [Morel and Uri \(2021\)](#) focus on France and find that \$140 billion of French domestic real estate was owned from abroad at the end of 2019, directly and through corporations. This represents less than 60% of our estimates for England and Wales in January 2018. Note however that our figures include both residential and commercial real

⁶⁹This means that we only focus on real estate assets owned by households and private corporations (both financial and non-financial).

⁷⁰Appendix B describes our property-type classification. [Johannesen, Miethe and Weishaar \(2022\)](#) classify a property as residential only if it appears in the OCOD register and matches a transaction in the Price Paid Data by address and timing—more restrictive than our approach.

estate while estimates for France only capture residential real estate. [Alstadsæter and Økland \(2022\)](#) combine for the first time residential and commercial real estate and find that at the end of 2017, about \$20 billion worth of Norwegian real estate was owned by non-residents. Exploiting data on 800,000 properties in Dubai, [Alstadsæter et al. \(2025\)](#) show that around \$100 billion in wealth is held in the Dubai property market from abroad, which represents slightly more than 50% of our estimates for offshore real estate held in London. The UK market also appears large once country size is accounted for: scaling by GDP, offshore-held real estate represents about 9% of GDP in the UK, against 4.4% in Norway and at least 5% in France.⁷¹

⁷¹GDP figures for 2018 are from the World Bank's World Development Indicators (<https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=FR-GB-NO>).

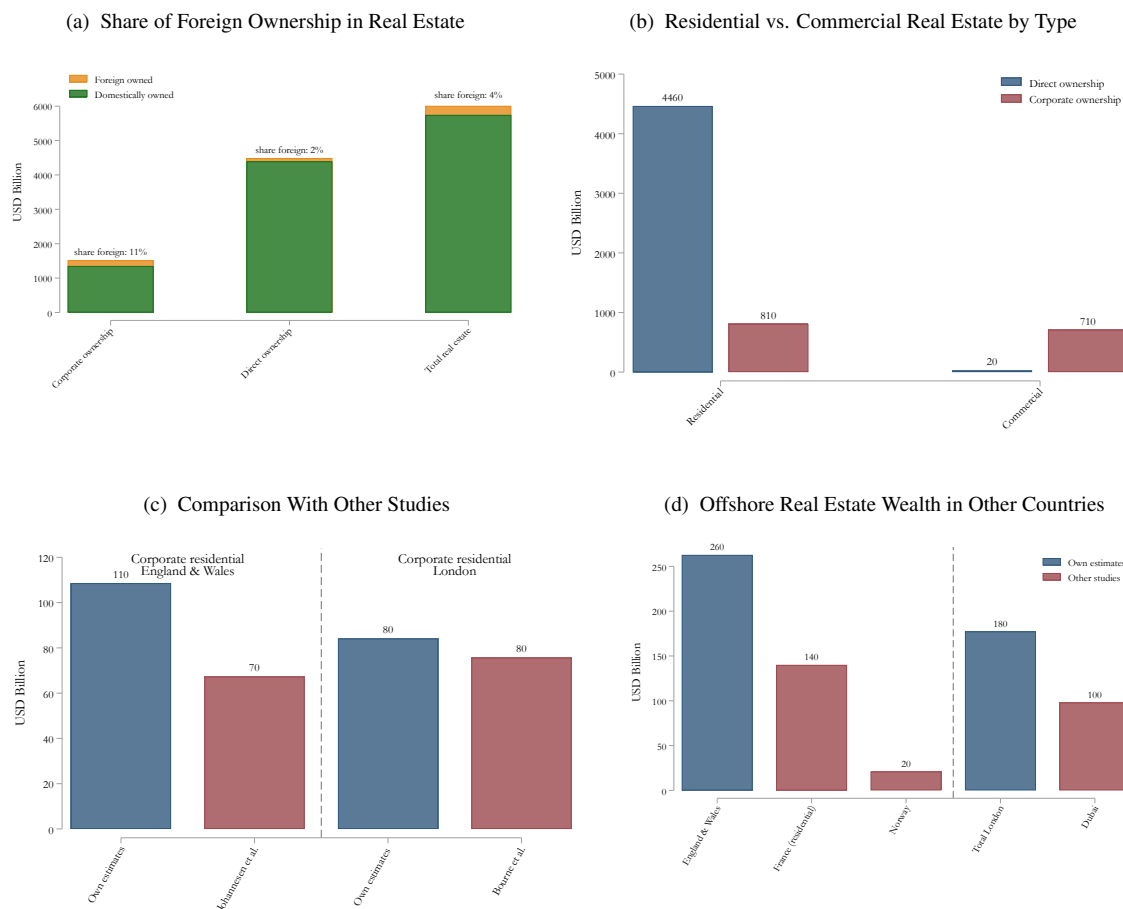


Figure F.1: Offshore Real Estate Market in the UK

Notes: Panel (a) shows the share of real estate wealth owned in England and Wales by type of ownership in 2018, together with estimates of the share owned from abroad. Panel (b) shows the size of residential and commercial real estate wealth owned in England and Wales, by type of ownership. Panel (c) compares our estimates of real estate wealth owned by foreign corporations, based on the Overseas Companies Ownership Dataset, with those of other studies. To make the comparisons meaningful, we restrict our estimates to the same market segment as each study: residential properties only for the comparison with [Johannessen, Miethe and Weishaar \(2022\)](#), and residential properties held in London only for the comparison with [Bourne, Ingiani and McKenzie \(2022\)](#). In the London comparison, the blue bar sits slightly above the red one although both display USD 80 billion, owing to rounding (all values are rounded to the nearest USD 10 billion): the underlying estimates are USD 76 billion for [Bourne, Ingiani and McKenzie \(2022\)](#) and USD 84 billion for ours. Our estimates are for January 2018, whereas [Johannessen, Miethe and Weishaar \(2022\)](#)'s figure refers to December 2019 and [Bourne, Ingiani and McKenzie \(2022\)](#)'s to January 2022. Panel (d) compares our estimates of real estate wealth owned from abroad with estimates of offshore real estate wealth for other countries; figures for France, Norway and Dubai are from [Morel and Uri \(2021\)](#), [Alstadsæter and Økland \(2022\)](#) and [Alstadsæter et al. \(2025\)](#), respectively. For France we use the same dollar estimates as [Alstadsæter et al. \(2025\)](#); the other studies' estimates are already expressed in dollars and are used as reported. All values are expressed in dollars at the January 2018 exchange rate.

F.2.2 Immediate Ownership of Offshore Real Estate in the UK

We first provide evidence of total ownership of UK real estate by country of *immediate ownership*. Country of immediate ownership corresponds to the country of residence of the buyer, when the purchase is made by an individual (direct ownership) or to the country of incorporation of the company, when the purchase is made by a foreign entity (indirect ownership).

Figure F.2a shows estimates of the value of the stock of real estate held by *individuals*, for the top 20 countries. Two-thirds of UK real estate directly held from abroad is linked to a dozen of countries, and more than 80% is owned by the top 20 countries. The main countries of residence are located in South-East Asia, including two tax havens, Hong Kong and Singapore. Other important countries are the United States, countries from the Arabian Peninsula (United Arab Emirates, Kuwait, Saudi Arabia), some European countries (Ireland, France, Italy) and Australia.

Figure F.2b provides estimates of ownership by country for corporate owners only. Indirect ownership is even more concentrated than direct ownership: the top 5 countries own almost 80% of indirectly held UK real estate in 2018. Ownership is also more concentrated among tax havens, as about 95% of the properties in the register are owned through companies incorporated in tax havens. The four most important buyers also have particularly strong links with the UK: the Channel Islands (Jersey and Guernsey), the British Virgin Islands and the Isle of Man. Jersey and the British Virgin Islands are the most popular jurisdictions for this type of investment, accounting for more than 40% of all foreign corporate purchases in the UK. Ownership from non-havens is mainly coming from the Netherlands, the United States and Germany.⁷²

Figure 2 combines estimates from Figures F.2a and F.2b and shows estimates of the value of the stock of real estate held by the top 20 countries of immediate ownership. The top 5 countries own about 50% of total foreign-owned real estate wealth, the top 10 countries own 65% and the top 20 own more than 80%. Moreover, the seven most important owners are often classified as tax havens.⁷³ In total, more than 74% of foreign investment in UK real estate goes through tax havens when including both properties purchased by individuals and corporations.

F.2.3 Ultimate Ownership of Offshore Real Estate in the UK

If the majority of foreign-owned UK real estate is held from tax havens, it is unlikely that the ultimate beneficial owners of these properties are effectively residents of these countries. This additional layer between an investor and their ultimate assets makes it harder to determine who owns real estate in the UK.

To formalize the problem, consider first that the total value of UK real estate wealth ultimately owned from country c through foreign companies is equal to I^c . Define Ω^O as the set of firms appearing in the OCOD and Ω_h^O a subset of Ω^O composed of all firms incorporated in jurisdiction h . Then, let us define as P_i the total value of UK properties owned by company i and as ϕ_i^c the share of owners of company i who are residents from country c . I^c is equal to $\sum_{i \in \Omega^O} \phi_i^c \cdot P_i$. If the jurisdiction of incorporation of company i and the country of residence of its owner are the same, namely if $c = h$, ϕ_i^c is equal to 1 for $c = h$ and 0 otherwise and I^c is simply equal to $\sum_{i \in \Omega_c^O} P_i$ which is directly observable in the OCOD. However, c and h do not coincide in most cases, in particular when h is a tax haven. Thus, as

⁷²Note that in the list of tax havens we follow (Menkhoff and Miethe, 2019), the Netherlands is not considered as a tax haven.

⁷³There is no consensus on which countries should be considered as tax havens. We use the list of tax havens of Menkhoff and Miethe (2019), which is obtained by combining the lists of Gravelle (2015) and Johannesen and Zucman (2014). They classify 58 countries as tax havens, which are listed in Appendix table A.6.

the OCOD provides information on the companies buying UK real estate but not on the owners of the companies, we lack information on ϕ_i^c .

To identify the beneficial owners of companies purchasing UK properties, we rely on information from the leaks and the additional beneficial ownership data detailed in Section 3.2. Specifically, we match the OCOD transaction data with the beneficial ownership data using the company name and its country of incorporation. The details of our matching algorithm are provided in Section D. This approach aims to observe ϕ_i^c for a subset of companies, and to use these values to estimate the geographical distribution of the ultimate owners of UK real estate.

Table F.1 summarizes the matching results, while Table F.2 presents the results by data sources. Overall, we identify ownership information for approximately 39,000 transactions, representing 42% of the property transactions in our sample. Many of the matched companies list other companies, rather than individuals, as their beneficial owners. After excluding these cases, the share of properties for which we identify ultimate individual owners drops to 29%, accounting for 33% of the total property value. For London specifically, the results are similar, with individual ultimate owners identified for 35% of properties. A significant share of properties are matched to owners linked to a tax haven.⁷⁴ In our benchmark scenario, we allocate all owners linked to a tax haven to their most probable country of residence. We do so by exploiting information on individuals' nationality from the Register of Overseas Entities. We provide details of this reassignment exercise in Appendix section F.3.1 and show later that the results hold when following alternative allocation assumptions. Note that the same two choices (dropping corporate owners and reallocating haven-linked owners to their likely residence) are made when constructing our exposure measure to the CRS (Section C.3).

Figure F.3a presents the results of our matching process for the main countries of ultimate owners buying in the UK. The blue bars show our benchmark scenario results while the red bars display the raw results, before the reallocation of the matches linked to tax havens. Residents of the United Kingdom constitute by far the main group of buyers through offshore companies. We discuss in section 6 the extent of the reallocation response to the CRS that can be attributed to UK investors. Beyond UK residents, investors from the Middle East, particularly the United Arab Emirates, account for a large share of identified ultimate owners. Given that residents in these countries often face very low or even zero effective tax rates on income and wealth, it is likely that their use of shell companies is motivated by secrecy concerns rather than tax avoidance. Other significant investor groups include residents of the United States, South Africa, both of which have strong historical ties to the UK and China.

Then, we assign the unmatched properties in the OCOD register to their owners' most likely country of residence based on the distribution we observe in the sample of matched properties. Figure F.2c shows ultimate ownership for the top 20 buyers. Figure F.2d is the counterpart of UK properties held by foreign individuals, after reallocating

⁷⁴Two elements can explain this result. First, in the Register of Overseas Entities, individuals have to provide a correspondence address and not a residence address. Some individuals likely delegate the management of their company to corporate service providers, some of them are based in tax havens. Second, in the Offshore Leaks data, individuals are linked to countries based on all information available, including business addresses and addresses of intermediaries, likely resulting in individuals being linked to tax havens even though they live elsewhere.

ownership from tax havens to likely “true” residence countries.⁷⁵ The detailed methodology used to obtain these estimates is provided in section F.3.3. Finally, combining properties held by foreign companies with those held by foreign individuals, we obtain a geographic distribution of total foreign ownership of UK real estate, shown in Figure 3. The United Kingdom remains the largest group of buyers through foreign vehicles, followed by countries from the Arabic Peninsula. South East Asian countries also make up a large share of real estate owners, which is driven by their importance in directly held properties.

Figure F.3b shows how our treatment of firms appearing as beneficial owners, and of owners linked to tax havens, affects our estimates. Reassigning ultimate owners that are companies, and owners located in tax havens, increases the amount of offshore real estate attributed to UK residents; nonetheless, this group remains the largest across all specifications. Appendix Figure F.3c presents an alternative allocation of the unidentified properties based on the leaks data.⁷⁶ This alternative allocation method has a very limited effect on the distribution of ownership.

		Number of transactions	Amount invested (£ billion)	Fraction of total transactions	Fraction of total amount invested
UK	Full dataset	93,366	119.1	100%	100%
	Matched	39,133	56.2	41.9%	47.2%
	Identified	26,855	39.9	28.8%	33.5%
London	Full dataset	43,932	89.0	100%	100%
	Matched	21,105	44.6	48%	50.2%
	Identified	15,492	33.5	35.3%	37.6%

Table F.1: Percentage of Companies Identified in the OCOD Sample (2018 Snapshot)

Notes: This table shows the number of OCOD transactions we manage to link with their ultimate beneficial owners’ using the Bahamas Leaks, the Offshore Leaks, the Paradise Papers, the Panama Papers, the Pandora Papers, OpenLux, CNBIOM data and the Register of Overseas Entities. Columns 2 and 3 show the raw number of transactions and their value in the full and matched samples, while columns 4 and 5 show the corresponding percentages the matched transactions represent. The “Matched” row shows these figures for all companies we find in one of these datasets. The “Identified” row shows these figures excluding companies whose beneficial owners are another company.

⁷⁵The method for this reallocation exercise is described in section F.3.2

⁷⁶This alternative uses the full information available in the leaks data, including both the country of incorporation of the company and the country of residence of the owner. See Appendix F.3.3 for details.

	Number of companies	Number of properties	Number of UBO
CNBIOM	30	71	35
OpenLux	163	314	206
Offshore Leaks	22	33	33
Panama Papers	572	987	1,004
Pandora Papers	190	298	329
Paradise Papers	79	154	296
ROE	9,970	24,998	11,737
Total	11,026	26,855	13,640

Table F.2: **Matching by Leak**

Notes: This table shows by data source the number of companies, of transactions and of ultimate beneficial owners in our matched sample, obtained after matching the OCOD dataset to the beneficial ownership registry based on the name of the companies and country of incorporation. We do not identify any beneficial owners using the Bahamas Leaks, hence we do not show it in the data sources. We discard matches if the ultimate owner is a company or is resident from a tax haven. The total number of properties (26,855) corresponds to “Number of transactions” for the UK at row “Identified” in Table F.1.

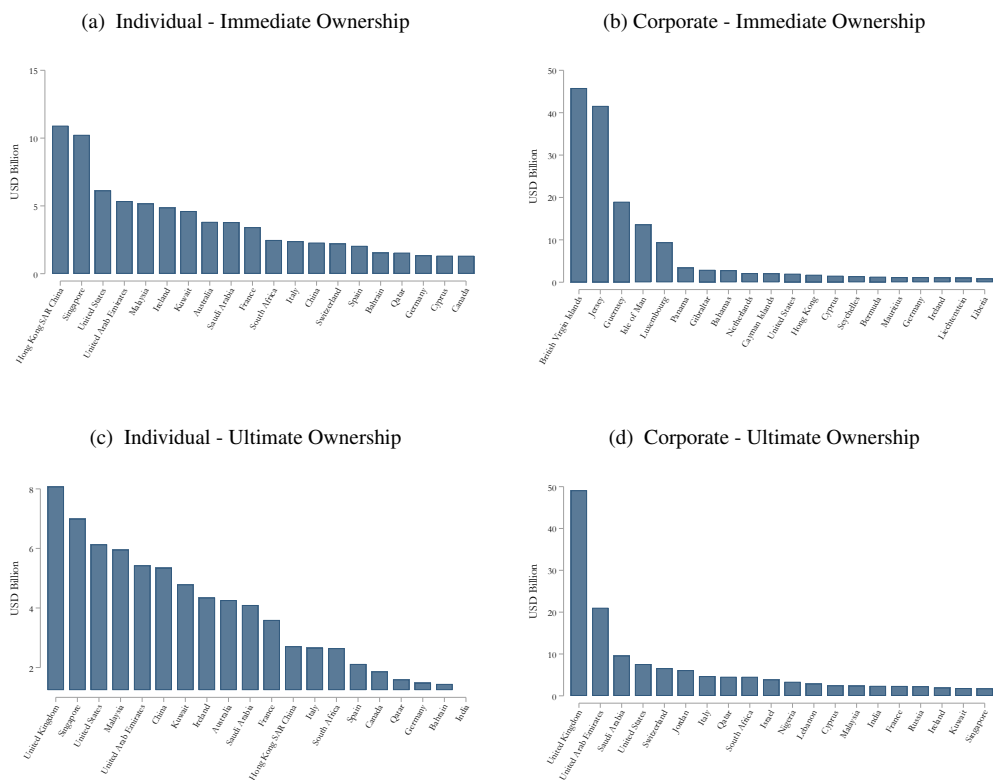


Figure F.2: Foreign Real Estate Ownership in the UK, Immediate and Ultimate Ownership

Notes: Panel (a) and (b) of this figure show estimates of the size of foreign owned real estate wealth by country of immediate ownership for the top 20 owners. Foreign owned real estate includes both properties held by individuals with foreign correspondence addresses and by foreign companies. In Panel (a), individual (or direct) ownership estimates are computed using a Freedom of Information Request established by the Centre for Public Data. In Panel (b), corporate (or indirect) ownership estimates are computed using the Overseas Companies Ownership Dataset. Panel (c) and (d) show estimates by country of ultimate ownership. Panel (c) presents estimates of ultimate ownership for properties held by individual with foreign correspondence addresses. Panel (d) shows estimates of ultimate ownership of properties held through foreign companies. We allocate the companies we did not find in the ROE or the Leaks according to the geographic distribution of UK real estate ownership estimated through observed matches. Estimates are for January 2018 and all values are expressed in dollars (January 2018's exchange rate).

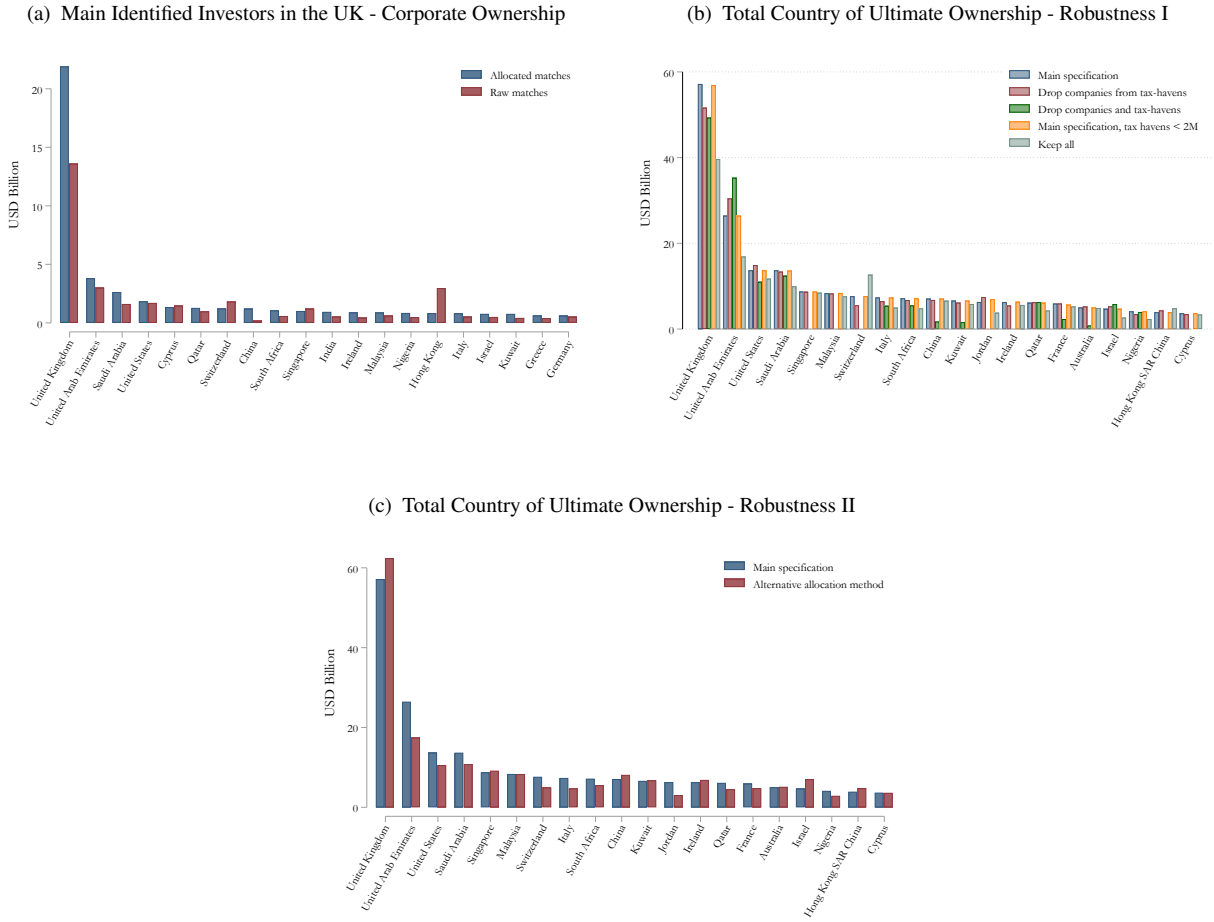


Figure F.3: Allocation of Ultimate Ownership – Robustness

Notes: Panel a) of this figure shows the distribution of country of residence of identified beneficial owners of companies holding real estate in England and Wales in January 2018. Data from companies holding properties in England and Wales comes from the Overseas Companies Ownership Dataset (OCOD). The red bars show ownership before reallocating ownership to tax havens using nationality information. The blue bars display results once the reallocation is done. Companies appearing as UBOs are dropped. Panel b) shows how various assumptions we make for our baseline estimates (in blue) affect the overall picture. Our baseline is based on the distribution of owners identified through the Register of Overseas Entities and the beneficial ownership data, where individuals linked to tax havens are allocated to their most probable country of residence. The first alternative specification (in red) keeps these tax havens as the ultimate country of residence of the owners, and only drops companies appearing as owners if they are incorporated in a tax haven. The second specification (in green) discards ultimate owners that are companies or that are linked to a tax haven. The third specification (in yellow) is a variation of our baseline which considers as tax havens only the jurisdictions in our list that have less than 2 million inhabitants (also keeping Hong Kong, Panama, Singapore and Switzerland). The last specification (in grey) keeps all matches. Panel (c) compares the baseline (in blue) to results obtained using an alternative method to allocate the ownership of properties for which the owner is unknown (in red). In the main specification, properties held through unmatched companies are allocated using the country distribution found in the subsample identified thanks to the Leaks data. This means that if in the sample of OCOD companies matched to the leaks, 25% of the real estate wealth is owned by the United Kingdom, we allocate 25% of the unidentified wealth to the United Kingdom. In the alternative allocation method (in red), we exploit information on country distribution identified through the leaks for each country of incorporation of companies. This means that if, according to matches between the OCOD and the Leaks 15% of owners of companies incorporated in the Bahamas are from the United Kingdom, we allocate 15% of the unidentified sample of Bahamas companies to the United Kingdom. We repeat this exercise for each country of incorporation. Estimates are for January 2018 and all values are expressed in dollars (January 2018's exchange rate).

F.3 Method - further elements

F.3.1 Reallocating Tax Haven Ownership - Foreign Firms

The country information we have used comes from the beneficial ownership data. It encompasses the Offshore leaks and OpenLux databases and the Register of Overseas Entities. However, information on country of residence could be erroneous for at least two reasons. First, in the Register of Overseas Entities, the country of residence variable is built using the correspondence address that beneficial owners are providing when the company is registered. They could choose to provide the address of their corporate service provider, or their wealth manager, services that are often provided in tax havens. For the Leaks, owners are linked to countries using all available information. This could lead to owners being wrongly associated to tax havens, if the only information available pertain to their offshore affairs and not to their true country of residence.

To gather the most accurate information on the residence of individuals in the corporate ownership data we leverage in this paper, we reallocate company owners from tax havens to their most probable country of residence. We proceed in two different ways. For matches with the Register of Overseas Entities, we have access to information on the nationality of the owners, in addition to their correspondence addresses. When the correspondence address is in a tax haven, we then reallocate the owner to their country of citizenship. Figure F.4a displays the effects of this reallocation on estimates of real estate wealth by country for properties held by companies identified in the ROE. As expected, the value of properties attributed to owners from tax havens decreases significantly. Individuals from jurisdictions like Hong Kong, Singapore and Switzerland, are estimated to own a smaller share of real estate than before. In contrast, the value of properties allocated to individuals from the United Kingdom increases significantly. This might be an overestimation, as some United Kingdom nationals residing in tax havens such as Switzerland, or Hong Kong, will wrongly be reassigned.

We then turn to owners identified thanks to the Leaks. One caveat of this data is that we do not have information on the country of citizenship of the owners of shell companies. We can therefore not reassign each owner to their country of citizenship individually, as we did for the Register. Instead, we borrow the residence-nationality relationship from the Register, where both are observed. For each tax haven, we measure in the Register the nationality composition of the owners whose correspondence address is in that haven, and we split the ownership initially attributed to that haven in the Leaks and OpenLux according to these same proportions. For example, if 30% of the owners with a Swiss correspondence address in the Register are French nationals, we reallocate 30% of the ownership initially located in Switzerland to France; we repeat this for every haven and every nationality.⁷⁷ Figure F.4b shows how this reallocation affects the geographical distribution of ownership.

⁷⁷This amounts to assuming that, within a given tax haven, the owners appearing in the Leaks and OpenLux have the same nationality distribution as those observed in the Register.

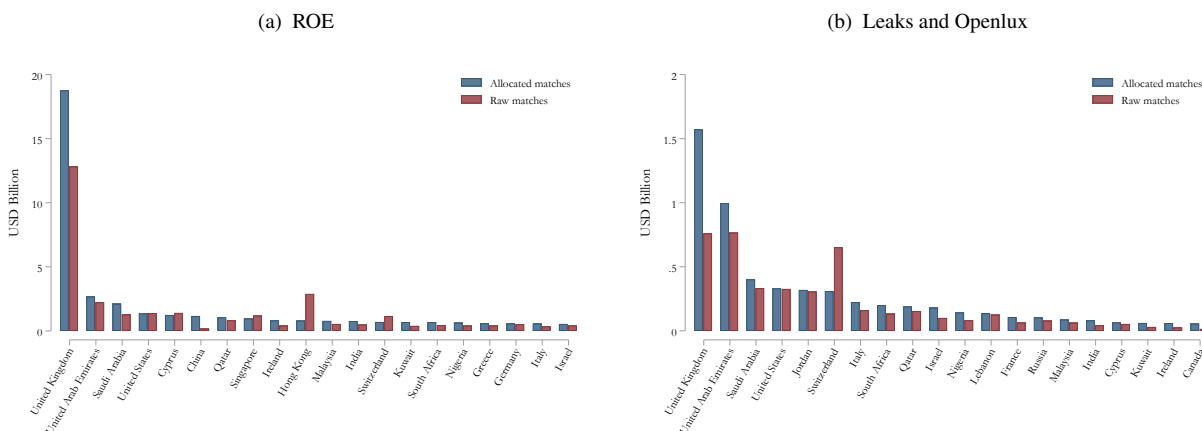


Figure F.4: **Effect of Using Nationality If Residence Country Is a Tax Haven**

Notes: This Figure shows how using nationality rather than country of residence affects allocated ultimate ownership of UK real estate for firms matched to the ROE (panel a) or to the Leaks/Openlux (panel b). Estimates are for January 2018 and all values are expressed in dollars (January 2018's exchange rate).

F.3.2 Reallocating Tax Haven Ownership - Foreign Individuals

As for corporate ownership, tax havens also frequently appear as the residence country of UK property holders in the case of direct ownership. It is however likely that the true owners are mostly non-haven residents: either the correspondence address is not the owner's real address, or the individuals appearing as haven residents are nominees rather than the true beneficial owners of the asset.

To reallocate direct ownership from tax havens to the most probable "true" country of residence, we use the same haven-to-nationality distribution as for corporate owners identified through the Leaks and OpenLux in Section F.3.1. In particular, we keep individuals with a correspondence address in a non-haven as residents of that country, and we split the value attached to each tax haven across countries of residence using the nationality composition of that haven's residents observed in the Register. Figure F.5 shows how this reallocation affects ultimate ownership. Mechanically, ownership from the UK is zero before the reallocation; it is substantial after. Ultimate ownership from China increases substantially, while that of Hong Kong and Singapore decreases.

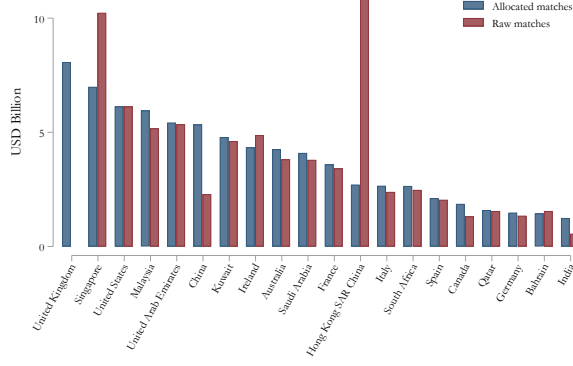


Figure F.5: **Effect of Using Nationality If Residence Country Is a Tax Haven - Direct Ownership**

Notes: This Figure shows how using nationality rather than country of residence for direct ownership affects allocated ultimate ownership of UK real estate for firms matched to the ROE (panel a) or to the Leaks/Openlux (panel b). Estimates are for January 2018 and all values are expressed in dollars (January 2018's exchange rate).

F.3.3 Allocating Real Estate Ownership held by Unmatched Firms

We identify the ultimate owner for 33% of the value of properties held by foreign companies in the United Kingdom. This section describes our method to allocate the value of unidentified properties to the most probable country of residence of their owners.

To formalize the problem, consider first that the total value of UK real estate wealth ultimately owned from country c through foreign companies is equal to I^c . Define Ω^O as the set of firms appearing in the OCOD dataset and Ω_h^O a subset of Ω^O composed of all firms incorporated in jurisdiction h . Then, let us define as P_i the total value of UK properties owned by company i and as ϕ_i^c the share of owners of company i who are residents from country c . I^c is equal to $\sum_{i \in \Omega^O} \phi_i^c \cdot P_i$. Decomposing I^c , we get:

$$I^c = \sum_{i \in \Omega^O} \phi_i^c \cdot P_i \quad (7)$$

$$= \frac{\sum_{i \in \Omega^O} \phi_i^c \cdot P_i}{\sum_{i \in \Omega^O} P_i} \cdot \sum_{i \in \Omega^O} P_i \quad (8)$$

$$= \rho^c \cdot \sum_{i \in \Omega^O} P_i \quad (9)$$

With ρ^c , equal to $\frac{\sum_{i \in \Omega^O} \phi_i^c \cdot P_i}{\sum_{i \in \Omega^O} P_i}$, being the share of corporately owned UK real estate in the OCOD dataset that ultimately belongs to owners from country c .

After our matching procedure, we observe the value of ρ^c for a subsample of companies Ω^B matched through the beneficial ownership data. In order to estimate I^c , we assume that the unmatched properties follow the country-by-

country distribution of ultimate ownership observed in the sample identified through the leaks. In other words, we assume that for the unidentified sample, ρ^c is equal to $\hat{\rho}^c$, with $\hat{\rho}^c = \frac{\sum_{i \in \Omega^L} \phi_i^c \cdot P_i}{\sum_{i \in \Omega^L} P_i}$, with Ω^L being the set of firms from the Leaks. This means that, if, in the sample of OCOD companies matched to the leaks, about 25% of the real estate wealth is owned by the United Kingdom, we allocate 25% of the unidentified wealth to the United Kingdom. We use the country distribution identified through the leaks data but not from the Register of Overseas Entities because the Register of Overseas Entities is likely to provide a biased picture of the offshore real estate market. As it is a UK policy, we are probably over-estimating the share of UK owners purchasing UK properties through shell companies, because UK residents would be more likely to comply with their reporting requirements. It probably also under-estimates the amount of properties held by e.g. Russians, as the Register was enforced following the sanctions taken against Russian individuals in February 2022. On the other hand, the Offshore Leaks are an event that can be considered as random from the point of view of the users of shell companies, who could not predict the disclosure of their ownership of these companies. As a result, they probably provide a more accurate picture of the origin of investments through shell companies in the UK.

Alternative method for corporate ownership We also estimate the geographical distribution of ultimate ownership using the full information available in the leaks data, including both the country of incorporation of the company and the country of residence of the owner. Instead of only considering the country distribution of owners identified through the leaks as in the main specification, we consider the country distribution identified through the leaks for each country of incorporation of a company. This means that if, according to matches between the OCOD and the leaks 15% of owners of companies incorporated in the Bahamas are from the United Kingdom, we allocate 15% of the unidentified sample of Bahamas companies to the United Kingdom. We repeat this exercise for each country of incorporation. Results, which are very similar to those obtained with our baseline method, are provided in Appendix Figure [F.3b](#).

G Taxes and UK Real Estate Ownership

The goal of this section is to better understand how the cost of investing in UK real estate evolved around the introduction of the CRS for different groups of buyers. First, we provide an overview of the main taxes applicable when purchasing or owning properties in the UK. Then, we highlight key tax changes and their implications for households investing in the UK property market through foreign (shell) companies. Finally, we highlight the key tax implications of owning UK properties depending on the location (UK/abroad) and status (individual/company) of the owner. While documenting the trade-offs faced by non-compliant households at the time of the CRS, this section also sheds light on the tax implications of the reallocation response to the CRS for UK tax revenues.

G.1 Main Taxes

Owners of UK properties typically face several key taxes, depending on their residency status, property type and usage. These taxes include the following:

- **Stamp Duty Land Tax (SDLT):** Paid upon purchase, with progressive rates based on the property price. The top marginal rate was 12% in 2021, with additional surcharges of 3% for second homes and buy-to-let properties and 2% for non-resident buyers. Reliefs are available for first-time buyers.
- **Income Tax or Corporation Tax on Rental Income:** Rental income is subject to UK tax. Individuals pay income tax at progressive rates (20%, 40%, 45%), non-resident companies (until 2020) pay income tax at a flat 20% rate, and domestic companies (and non-resident companies from 2020) pay Corporation Tax.⁷⁸
- **Inheritance Tax (IHT):** UK property held by non-UK residents or UK residents is subject to IHT at 40% for estates exceeding a nil rate band (which has been fixed at £325,000 since 2009/10), even when held through foreign companies (since 2017). Since April 2017 there is also an additional residence nil rate band (with a value of £175,000 since 2020/21) when the main residence of a deceased is inherited by their direct descendants.
- **Council Tax:** An annual local tax for residential properties, calculated based on the property's valuation band and local council rates. The person living in the property is generally responsible for paying Council Tax, whether they are the homeowner or tenant. For vacant or second homes, the owner may be responsible. The equivalent for commercial properties is business rates (although based on an estimation of the property's annual rent, instead of value).
- **Annual Tax on Enveloped Dwellings (ATED):** An annual tax payable by companies owning UK residential property valued above £2M in 2013 (the threshold has been reduced since April 2016 to £500,000), although

⁷⁸From 2011 to 2017, the main Corporation Tax rate decreased from 28% to 19%. In 2023, the main rate was increased to 25%.

relief is available for properties rented out to unconnected persons. The tax schedule is designed in 6 bands, with a progressive fixed charge applying per band, ranging from £3,700 (for properties valued below £1M) to £237,400 (for properties valued above £20M) in 2021-2022. ATED-related Capital Gains Tax (CGT) was introduced in 2013, applying a 28% CGT rate on disposals of properties subject to the ATED regime.

- **Capital Gains Tax (CGT):** Applies to gains from the sale of UK property, but gains on main residency of the taxpayer are tax exempt (although the relief is usually not available to non-residents). From 2016/17 to 2023/24 rates were 18% for basic-rate taxpayers and 28% for higher-rate and additional rate taxpayers. From 2024/2025 rate for residential property owned by higher- and additional-rate taxpayers was reduced to 24%. From October 2024 rates on residential and non-residential properties have been equalized to 18% for basic-rate taxpayers and to 24% for higher- and additional-rate taxpayers. Non-residents were taxed only on gains accrued from April 2015 (residential) or April 2019 (commercial). After 2015, non-resident CGT applies instead of ATED-related CGT in many cases.

G.2 Tax Reforms

Since 2012, several major tax reforms have targeted foreign companies holding UK properties, primarily to increase tax transparency and reduce tax avoidance through corporate “wrappers”. These reforms significantly impacted investors owning UK properties through foreign companies during the 2012–2017 period:

- **March 2012:** A 15% SDLT rate was introduced for corporate entities (vs. a top rate of 7% for individual buyers) purchasing residential properties valued over £2M. This threshold was lowered to £500,000 in 2014.
- **April 2013:** ATED was introduced, imposing an annual charge on high-value residential properties held by corporate entities. Rates ranged from £15,000 (properties between £2M and £5M) to £140,000 (properties above £20M). The ATED threshold was reduced to £500,000 in April 2016. ATED-related CGT was also introduced, applying a 28% CGT rate on disposals of ATED-subject properties.
- **April 2015:** Non-resident companies became subject to pay corporation tax at a 20% rate on gains on disposals of UK residential property. This marked the first time non-residents were broadly taxed on UK property gains. In April 2019, tax on non-residents’ gains was extended to all UK land and properties and indirect disposals, such as selling shares in companies deriving at least 75% of their value from UK property.
- **April 2017:** Non-residents and non-domiciled individuals lost their IHT exemption on residential properties held through offshore companies. IHT now applies to the fraction of a company’s value attributable to UK residential property.

To summarize, from the 2014 Joint Announcement to 2017, the tax benefits of holding UK residential properties through foreign companies were reduced by several measures, including: (i) lowering the SDLT threshold for the 15% rate (2014); (ii) extending to non-residents the taxation of gains from residential property (2015); (iii) lowering the ATED threshold (2016); and (iv) extending IHT to offshore-held properties (2017). However, these reforms primarily targeted residential properties. Commercial properties remained subject to lower SDLT rates, were exempt from ATED and exempt from tax on the gain on their disposal (until 2019), and continued to offer IHT benefits for offshore owners (in part repealed in 2019). Post-2017 reforms have further diminished the tax advantages of offshore UK property ownership, leaving limited benefits today, such as IHT relief for commercial properties held through offshore entities in some specific cases.

G.3 Direct, Indirect, Domestic and Foreign Ownership of Real Estate

The tax implications for owning UK property vary significantly based on the investor's residency status, whether the property is held by an individual or a company and whether the property is used for residential or commercial purposes. In the following, we highlight the key tax implications of purchasing and owning a UK property:

- for foreign corporate vs. non-resident individual investors,
- for non-resident vs. domestic individuals, and
- for foreign vs. domestic firms.

As many tax reforms altered the relative advantages of ownership schemes and residency statuses, we describe the main differences based on the January 2015 legislation and mention some of the subsequent changes.

Non-resident direct vs. foreign corporate ownership

Holding UK property through a foreign company rather than as a non-resident individual offers several benefits:

- First, purchasing shares in a foreign company holding UK property avoids Stamp Duty Land Tax (SDLT), as share transactions are not subject to SDLT, unlike direct property acquisitions.
- Second, until 2019, selling shares in a foreign company eliminated Capital Gains Tax (CGT) liabilities that apply to direct property sales.⁷⁹
- Third, prior to 2017, holding UK property through a foreign company allowed non-residents (and non-domiciled) to avoid Inheritance Tax (IHT), as only company shares were transferred rather than the property itself. This exemption was removed for residential properties in April 2017, but remained for commercial properties.

⁷⁹From 2019, indirect disposals of interests in "property rich entities" became subject to non-resident CGT if the non-resident investor holds or has held a 25% or greater interest in the company. "Property rich entities" are companies where at least 75% of gross asset value comes from UK property, whether residential or commercial.

- Fourth, rental income from properties held by foreign companies was taxed at a flat 20% income tax rate, often more favorable than the progressive income tax rates faced by individuals (up to 45%).⁸⁰

However, indirect corporate ownership also has drawbacks compared to direct ownership:

- Corporate buyers of residential properties face higher SDLT rates: 15% vs. 12% (top rate) for direct buyers in 2015.⁸¹
- Since 2013, foreign corporate owners have been subject to the Annual Tax on Enveloped Dwellings (ATED), applying to high-value residential properties. ATED rates depend on property value, ranging from £3,700 (for properties below £1M) to £237,400 (for properties above £20M) in 2021–2022.⁸² Importantly, ATED does not apply to commercial properties.

In summary, while the advantages of corporate ownership have declined over time, they remained significant during the study period, particularly for commercial properties.

Foreign vs. domestic individuals

Non-resident individuals benefited from key advantages over UK residents, particularly with respect to CGT. While UK residents paid CGT on all gains, non-residents were exempt until 2015 and were only taxed on gains accrued after 2015. Gains on commercial properties became taxable only from 2019, and only on gains accrued after that date. However, non-residents do not usually qualify for Private Residence Relief (PRR), which exempts gains on primary residences from CGT. Additionally, a 2% SDLT surcharge for non-resident buyers was introduced in 2021, which is however outside of our sample period.

Foreign vs. domestic firms

The key advantage for non-resident over resident firms before 2017 was in Inheritance Tax (IHT): UK residential property held through a foreign company could avoid IHT liabilities for non-residents and non-domiciled individuals, as only the shares of the company were transferred (which were not considered to be UK assets), not the property itself. Conversely, UK property held directly through a UK company triggered IHT on the death of a shareholder. This distinction ended in 2017 for residential properties. From 2021, non-resident firms became subject to a 2% SDLT surcharge on residential properties, which does not apply to UK firms.

Before 2020, rental income taxation further distinguished UK-resident and non-resident firms. Non-resident firms paid Income Tax on rental income at a 20% tax rate, whereas UK firms instead paid Corporation Tax at a 19% rate.

⁸⁰The owner of the company may also pay taxes on dividends received.

⁸¹For companies running a property rental business, the 15% SDLT rate did not apply until April 2016, when a 3% surcharge for second homes was introduced.

⁸²Properties let to unconnected parties qualify for relief and are exempt from ATED charges.

This affected available deductions and reliefs. From April 2020, non-resident firms were aligned with UK companies under the Corporation Tax regime, providing greater flexibility in claiming deductions and offsetting losses.

G.4 Tax Incentives of Owning UK Offshore Real Estate for UK Owners

One key advantage of using shell companies to invest in UK real estate is the ability for investors to keep their identities hidden.⁸³ Since investment in UK real estate through offshore entities may result in lower tax liabilities for non-residents compared to UK residents, some UK residents holding offshore property and seeking to evade taxes may have concealed their country of residence to claim similar tax benefits as non-resident investors. This is particularly relevant in the case of UK taxpayers reallocating their offshore portfolios toward UK real estate as a way to circumvent the CRS. Thus, when assessing the tax advantages for UK residents to invest in UK properties through offshore entities rather than directly, we can consider that these advantages are similar to those faced by non-residents although in many cases entailing tax evasion with the corresponding risk of detection.

During our sample period, regardless of whether the owner was a UK resident or not, the trade-off between foreign corporate ownership and direct ownership of UK properties was similar for many taxes (see above). Although the advantages of corporate over direct ownership diminished over time, they remained significant until 2017, particularly for commercial properties. Moreover, UK residents were subject to CGT throughout the period for direct ownership (except for primary residences), while non-residents were exempt until 2015 for residential properties and 2019 for commercial properties (and then still exempt from tax on gains accrued before those dates). This element made the advantages of foreign corporate ownership over direct ownership even more pronounced for UK residents during this period.⁸⁴

⁸³This advantage was largely reduced in 2022–2023 with the implementation of the Register of Overseas Entities (ROE). From this date, all foreign entities holding UK properties were required to report the identity of their beneficial owner—even though important loopholes remain.

⁸⁴This is no longer the case, especially following the introduction of the 2% SDLT surcharge for non-resident buyers in 2021.