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**The end of Londongrad? The impact of
beneficial ownership transparency on offshore
investment in UK property**

Matthew Collin,¹ Florian M. Hollenbach,² and David Szakonyi³

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Abstract: The United Kingdom's (UK) property markets are thought to be a common destination for corrupt and criminal assets and money laundering, with investment often through offshore shell companies. Following the Russian invasion of Ukraine in 2022, we study the impact of the introduction of a policy in the UK intended to increase transparency and eliminate the anonymous ownership of property by requiring offshore companies to file their ultimate beneficial owners on a public register. We find that new purchases by companies based in tax havens fell substantially following government announcements that the policy would be introduced that year, and further declined following the establishment of a register of ownership. While the policy has effectively led the offshore market to stall, £44–76 billion worth of UK real estate is still owned by companies based in tax havens, most of which have yet to comply with their reporting obligations. We do not find strong evidence of price effects nor substitution into ownership through suspicious domestic companies, although larger movements may manifest as firms react to the finalization of the policy in early 2023.

Key words: money laundering, real estate, beneficial ownership, transparency, invasion of Ukraine

JEL classification: H20, H26, H71

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¹ Grupo de Análisis para el Desarrollo, Lima, mattcollin@gmail.com; ² Copenhagen Business School, Copenhagen, fho.egb@cbs.dk; ³ George Washington University, Washington, DC, dszakonyi@email.gwu.edu

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Katajanokanlaituri 6 B, 00160 Helsinki, Finland

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1 Introduction

Real estate is a common destination for the proceeds of corruption, money laundering, and tax evasion (FATF 2007). A large number of anecdotes indicate that high-value property markets in locations like London, New York City, and Miami are frequently targeted by individuals suspected of engaging in corruption (Gabriel 2018; OCCRP 2021; White 2020; Wieder et al. 2021). London, in particular, has been singled out as a popular market, so much so that journalists are running a guided *Kleptocracy Tour*, showing off London properties owned by kleptocrats (Borisovich 2016).

Real estate markets are attractive because they are often subject to less transparency than the banking sector. For example, those looking to avoid being subject to cross-border tax transparency regulations, such as automatic exchange of information (AEOI) agreements, can avoid them by holding their wealth in property (Bomare and Herry 2022). In many economies, including the UK, real estate agents and others involved in transactions are not typically required to apply any of the due diligence or background checks on their clients' source of wealth that would be common in other financial sectors. Finally, and perhaps most importantly: in many economies it is possible to own property through shell companies based in tax havens, which obscures the final owner's name from public records, affording a high degree of secrecy.

One of the oft-touted solutions to this problem is *beneficial owner transparency*. Beneficial owner registries mandate companies to reveal their ultimate owners, either to the government or to the public (via open registries), thereby—in theory—removing the ability to hold real estate anonymously. However, beneficial ownership in the real estate sector has not been subject to much empirical scrutiny. A recent study of a pilot programme of beneficial ownership reporting in US real estate found no evidence that investment in high-value markets declined, indicating that it had little deterrence effect (Collin et al. 2021). The authors contend that a lack of enforcement and validation of the beneficial owner data led to its reduced effectiveness, suggesting that implementation is a crucial factor in the success of these policies.

This paper presents an impact evaluation of a recent law passed by the UK government that imposes beneficial ownership transparency over all UK properties held by overseas companies. Fast-tracked as part of the UK government's response to Russia's invasion of Ukraine in February 2022, the Economic Crime Bill (ECB) (passed as the Economic Crime Act) established a public and retrospective 'Register of Overseas Entities' which will list offshore companies that own real property in the UK and their beneficial owners (those that hold 25 per cent or more of voting rights). Exploiting several UK administrative datasets on land ownership and company registration, we adopt a difference-in-differences design around the announcement and implementation of ECB to analyse whether the policy impacted purchases and sales of property by companies based in specific overseas jurisdictions where concerns about illicit financial flows may be greatest.

We find that following the introduction of the ECB in February 2022 (and its eventual passing in March), purchases of UK property made by companies based in tax havens fell sharply, and remain lower today. Sales also decline over time, leading to an effective stalling of the property market between offshore companies based in havens. When we compare purchases by companies from tax havens that are more likely to be used by Russians, we find a more immediate drop following the invasion. However, havens known to be used by individuals from highly corrupt countries and those participating in AEOI agreements also fall in the long term. In all cases, the decline in property transactions involving tax havens accelerates following the implementation of the ECB in August, at which point the reporting requirements for companies became a prerequisite for the registration of ownership of title. We do not find any persistent effect on prices in local authorities that were relatively more popular targets of offshore investment pre-policy, nor evidence of diversion of investment in suspicious domestic companies. However, as

the ECB is still in mid-implementation (companies have until the end of January 2023 to fully comply), we could potentially see more movement in property markets as overseas companies are brought into compliance and potentially sell their existing stock.

In this paper, we make several contributions to the empirical literature on beneficial ownership transparency and efforts to combat cross-border money laundering. First, it is one of the first evaluations of a policy intended to counter illicit flows by increasing transparency within a single property market, joining work by Agarwal et al. (2020) which shows how sectoral regulation can reduce prices of real estate assets bought by persons linked to offshore shell companies. We argue that the observed short-term effectiveness of the ECB is due to the public-facing nature of the beneficial ownership registry being introduced, which stands in contrast to the Geographic Targeting Orders (GTOs) introduced in the United States that kept such information in government hands and produced little to no deterrent effect on all-cash purchase activity by shell companies (Collin et al. 2021).

We also contribute to a growing body of work documenting both the stock of foreign ownership of property in coveted markets, such as Dubai (Alstadsæter et al. 2022), France (Cvijanović and Spaenjers 2021), Norway (Alstadsæter 2022), and the UK (De Simone 2015; Sá 2016), as well as the determinants of foreign and anonymous investment. For example, Bomare and Herry (2022) show that a significant amount of wealth flowed into the UK property market following the introduction of AEOI reporting, as property fell outside of the beneficial reporting regime (which was relegated to financial accounts). The paper shows that in addition to taxes (Gorback and Keys 2020), policy tools centred around transparency can affect investment inflows and prices paid for real estate. As we show slight differential effects on Russia-preferred tax havens, we also contribute to the literature on how political risk abroad affects local real estate markets (Badarinza and Ramadorai 2018).

Finally, our work builds on a literature on how policies aimed at revealing ultimate ownership can drive anonymous or illicit wealth out of targeted markets. This includes research documenting the significant, negative impact that transparency initiatives have on various forms of offshore wealth (Beer et al. 2019; Casi et al. 2020; Menkhoff and Miethe 2019; O'Reilly et al. 2019) and a number of studies showing that increasing the chance of discovery by authorities can force those who have previously enjoyed anonymity to begin complying (Bethmann and Kvasnicka 2016; Londoño-Vélez and Ávila-Mahecha 2021).

2 Background and analytical framework

2.1 'Londograd'

To date there are no definitive estimates of the amount of illicit money that has made its way into the UK property market. Shortly prior to the invasion of Ukraine, Transparency International estimated that since 2016, roughly £1.5 billion of UK property had been bought by Russians with ties to the Kremlin (Transparency International 2022a). Broadening the scope, the investigation of the leaked files in the Pandora Papers uncovered roughly £4 billion in secret UK property transactions linked to 'heads of government, oligarchs, business tycoons, ruling families and a Middle Eastern monarch' (Goodley and Smith 2021). Many observers, however, believe the total amount of illicit money to be of a magnitude larger, given that offshore companies own over 138,000 properties in the UK worth a collective £55 billion (Neate 2022a).

Several features of the UK property market make it especially attractive to criminals, kleptocrats, and other fraudsters. First, the market is both huge and relatively easy to access. Since the 2008 financial crisis, the UK has courted foreign investors with so-called 'golden visas', a programme exploited by

numerous corrupt officials seeking to launder their money (Neate 2022b). Their identities were protected by the UK's reputation for opacity in corporate affairs, and, in particular, its strong historic links with the Crown Dependencies and Overseas Territories, notorious tax havens and secrecy jurisdictions that require relatively little information from wealthy individuals looking to hide their cash (Mitchell 2021).

Dirty money could easily be moved into the UK system itself: UK corporate entities are relatively easy to establish, with low costs of filing and rare audits (Davies 2019). Filing company documents does not require identity verification, requiring less than what it takes to acquire a library card (PA Media 2022). Individuals can purchase properties using a multi-layered, international schema of shell companies, successfully concealing their true beneficial ownership.

For example De Simone (2015) find that, out of all properties connected to owners under investigation for corruption, over 75 per cent were purchased using a company based in an offshore jurisdiction with high levels of financial secrecy. Tax evasion also appears to be a significant driver of offshore investment in the UK property market. Bomare and Herry (2022) estimate that up to £19 billion—or 1.5 per cent of all real estate investments—were invested into the UK property market via offshore companies between 2013 and 2016 as a means to evade the OECD's Common Reporting Standard (CRS) reporting requirements, which mandated that offshore banks begin transmitting information on their customers' financial accounts to tax authorities around the world. Figure 1 maps the concentration of property owned by overseas companies using Land Registry data described in Section 3. Inner London has seen huge inflows of money from overseas companies, leading to the nickname 'Londongrad' and sparking concerns about Britain serving as the 'butler to the world' for its service as an enabler of illicit financial flows (Bullough 2022).

2.2 The 2022 Economic Crime Act and the Register of Overseas Entities

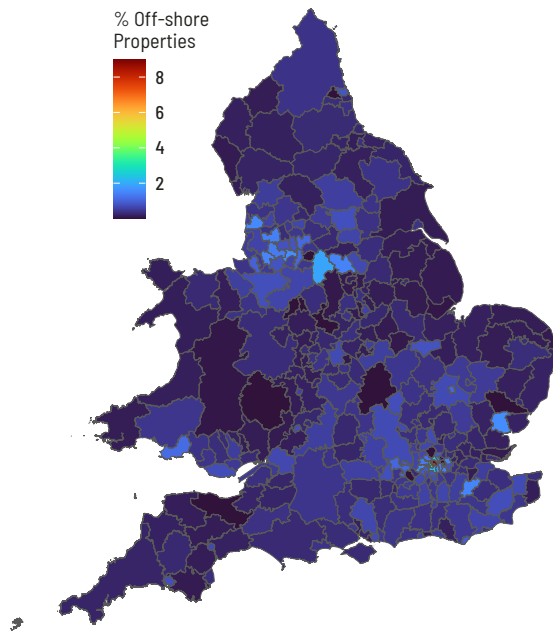
By the mid-2010s, the UK's unsavoury reputation as a hub for money laundering finally forced politicians to consider taking action. During the 2016 Anti-Corruption summit, then-Prime Minister David Cameron announced that the UK would implement a registry of beneficial ownership covering all overseas firms that owned UK property. Introducing transparency, it was believed, would deter bad actors from exploiting the real estate sector. Those plans were derailed a few months later when the Brexit Referendum led to Cameron's resignation. Subsequent Conservative Party leadership deprioritized the initiative, which languished for nearly seven more years. UK Minister for Efficiency and Transformation Lord Theodore Agnew even resigned from his post in frustration that the government was stalling on the reform (Makortoff 2022). His resignation finally spurred Prime Minister Boris Johnson to confirm on 2 February 2022 that the bill would be put to a vote in the third parliamentary session of 2022.¹

The winds shifted further following Russia's invasion of Ukraine on 24 February 2022, when the size and scale of the misuse of the UK's economy by illicit actors—including many Russian oligarchs—rose to the top of media agendas and became politically intolerable. Cracking down on Putin's wealthy allies was seen as a way to dissuade him from pushing further militarily into Ukraine. As a result, the ECB was fast-tracked. It was introduced in Parliament on 1 March and received Royal Assent just over two weeks later; upon becoming law, the policy became known as the Economic Crime Act (ECA).²

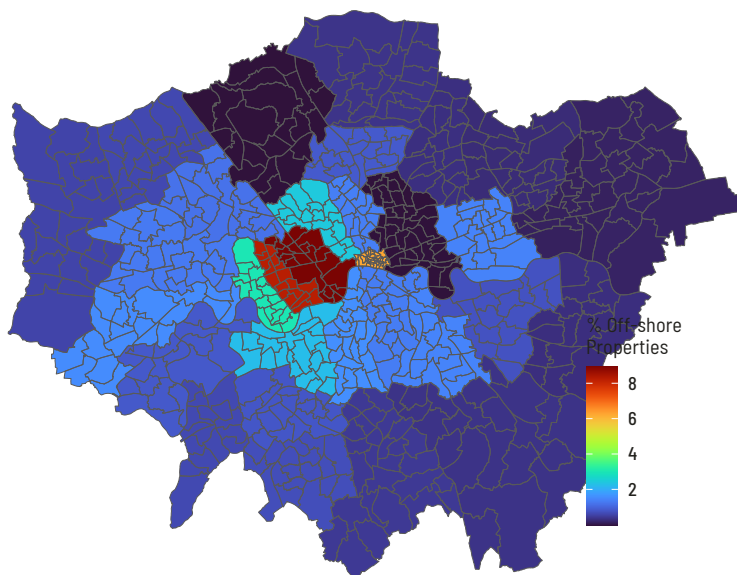
¹ Engagements—Hansard—UK Parliament, volume 708: debated on Wednesday 2 February 2022; available at: <https://hansard.parliament.uk/Commons/2022-02-02/debates/41AF283E-4832-47D5-9C10-339B965FB2E7/Engagements> (accessed 15 November 2022).

² The first reporting of the bill's resurrection came on 27 February (Pickard 2022).

Figure 1: Overseas property ownership across England and Wales
(a) England and Wales



(b) London only



Note: the map shows the estimated proportion of all properties (residential + commercial) in each local authority owned by overseas companies at the start of 2020. The data on property ownership are described in Section 3.

Source: authors' compilation.

A key component of the ECB was to introduce a Register of Overseas Entities that required all overseas companies that own land in the UK to report the identity of their beneficial owner(s). Any overseas

firms that had existing holdings³ or acquired new holdings prior to 1 August 2022 would be subject to a transitional period, and would have until 31 January 2023 to submit beneficial ownership information to the register. As a backstop, the new law also required that any overseas firm that wished to sell property it already owned after 28 February 2022 would also be required to register with Companies House; otherwise a property could not be sold.⁴ The register would be released publicly on 1 August 2022. From then on, all foreign companies that purchased UK property would have to submit beneficial ownership information to the register in order to obtain legal title from the UK Land Registry.

As envisioned by the bill, the Register of Overseas Entities would also share several key similarities with other corporate registries implemented by the UK government. First, the register will be public, retrospective, and updated regularly, a remarkable step that distinguishes the UK from several of its counterparts in the OECD currently trying to combat illicit financial flows. For example, in late 2020, the United States passed a law to begin establishing a corporate beneficial ownership registry, but the data will not be made publicly available, instead only being released to authorized government agencies (Squire Patton Boggs 2022). Second, the register adopts the same ‘broadly sufficient’ definition of beneficial ownership as that applied to UK companies (Transparency International UK n.d.) . Finally, the bill lays out serious punishments for non-compliance, from daily fines to a maximum sentence of five-year imprisonment.

Even though many welcomed the government’s recharged efforts to bring transparency to this sector, serious concerns lingered about whether the legislation would be strong enough to make a real impact. A series of investigative reports have uncovered deep problems in existing Companies House registries, from fraudsters using fake names to register companies,⁵ to a substantial number of companies refusing to file reports altogether (Global Witness 2013; Williams 2022). Activists sounded the alarm that the ECB contained the same loopholes allowing companies to simply deny having any qualifying beneficial owners (Transparency International UK n.d.). Another loophole would allow companies to report nominee owners and directors, oftentimes arranged in agreement with professional service firms, rather than their true beneficial owners (Beioley et al. 2022).

Moreover, verifying ownership reports requires extensive resources, something the UK government has not historically prioritized. Over the period of 2016–21, the NGO Spotlight on Coalition calculated that the UK spent just 0.042 per cent of its GDP (£852 million) per year to fight economic crime, a drop in the bucket considering economic crime can exceed £100 billion per year (The Economist 2022). Registering a company through Companies House costs just £12, limiting the agency’s ability to fund comprehensive and preventive measures to ensure the accuracy of every report (Hawley 2022). Although follow-up legislation (the so-called Economic Crime Bill 2.0) has proposed to reform Companies House and grow its investigative capacity, discussions are still ongoing and passage is far from guaranteed.

The register went live on 1 August 2022, with all firms having until 31 January 2023 to finalize their registration. To date we can identify only 8.4 per cent of those foreign companies owning property in the UK prior to 1 August 2022 in the registry.⁶ Those that fail to register by that deadline will be—as per the ECB—subject to a daily £2,500 fine.

³ Existing holdings were defined as any properties acquired since January 1999. Transparency International UK identified 1,892 properties purchased by overseas companies prior to this date that would be declared exempt under the bill (Transparency International UK n.d.).

⁴ Concerns were raised that the extended grace period might enable overseas owners to dispose of or transfer real estate assets without ever revealing their connection. The provision that transactions cannot occur unless ownership information is submitted somewhat allays that fear (Walker 2022).

⁵ Some of the most egregious examples included Jesus Christ, Donald Duck, and ‘Adolf Tooth Fairy Hitler’

⁶ The exact percentage is unknown as there is no public data on overseas firms that own property in Scotland or Northern Ireland.

2.3 Expected impact and analytical framework

In the remainder of the paper, we undertake an impact evaluation of the ECB and its beneficial ownership transparency policy. In contrast to the United States' GTO Program (Collin et al. 2021), the UK register is public and retrospective, eventually applying to all purchases made after 1999. In our view, the public nature of the data should make the registry more effective than other efforts. In practice, however, the UK has a spotty history of enforcing its existing beneficial ownership registries, such as the one that exists for domestic companies.

Our theoretical expectations about the effect of the ECB are quite uncertain, especially given the wide range of possibilities about how the policy is being implemented. As noted above, we are primarily interested in whether the announcement, fast-tracking, and introduction of the ECB leads to a significant deterrence effect on offshore investment in UK property. To answer this question, we analyse changes in the 'stock' of properties owned by overseas companies and new purchases as well as sales by overseas companies.

The most likely scenario, in our view, is that the ECB causes a decrease in both the stock of UK properties owned by overseas companies and a fall in the number of purchases by overseas companies after March 2022. While the policy could potentially turn out to be ineffective in the long run, we expect at least a short-term effect in the immediate aftermath of the law's adoption.

To identify a potential effect, we use two treatment groups (further described below). Our first treatment group is all overseas buyers who are registered in offshore tax havens. To further pinpoint a possible effect, we then separate overseas buyers by types of tax havens. We expect any causal effect of the ECB to be particularly visible for overseas companies registered in havens known to be popular with groups with a strong incentive to obscure their ultimate ownership.

A decline in the flow of new purchases by overseas companies, particularly those located in secrecy jurisdictions, would indicate that the policy has affected the returns to secrecy, at least in the short run. In addition to looking at the number of purchases and owned properties, we also estimate models with price volume as the dependent variable. Given the generally high value of properties purchased with illicit wealth, we would expect a relatively large effect, at least in the short run.

We also investigate possible substitution by examining whether purchases made by UK companies with high-risk characteristics (i.e. those displaying signs of being shell companies) will increase, as individuals look for new means of maintaining anonymous ownership. The drop in purchases by overseas companies may be attenuated by suspicious money finding its way to the same properties using alternative mechanisms. To test this potential mechanism we test whether more suspicious domestic firms increase property purchases in areas targeted by overseas investors in the past. Finally, we attempt to differentiate the impact of the ECB from that of Russia's invasion of Ukraine (as described in more detail in Section 6.3).

3 Data

To address these questions, we use a number of publicly available data sources, which are detailed below.

3.1 Determining domestic and foreign corporate property owners

We track purchases and sales of UK properties by companies using two registries from the UK Land Registry: (1) Overseas Companies that own property in England and Wales (OCOD)⁷ and (2) UK Companies that own property in England and Wales (CCOD).⁸ OCOD has been updated monthly since October 2015 and contains a list of title registrations in England and Wales ‘where the registered legal owner is an overseas company (a company incorporated outside of the UK).’⁹ CCOD includes information on all properties bought by companies registered in the UK since March 2014; editions were issued quarterly for the first three years, and then monthly since 2017. The data used in this paper is from the 4 January release.

Although the OCOD and CCOD registries capture all title registrations involving overseas and domestic companies, they both have several limitations that must be handled carefully during the data analysis. First, OCOD and CCOD only contain information on the overseas and domestic companies involved in the transaction, and not other parties. For example, if an overseas company sells a property to a natural person, that appears as an entry in OCOD with information on the seller, but as these databases did not collect data on individuals, we have neither information on who the buyer is nor, in many instances, when the property was bought.¹⁰ If a domestic company sells a property to an overseas company, the sale is registered as an entry in the CCOD data, while the purchase is registered in the OCOD data.

Therefore, we combine the OCOD and CCOD databases into a single ‘corporate property registry’ of all property sales that involved either an overseas or domestic company. We merge based on the title change date and the title number. We code all buyers and sellers where data is missing (i.e. not an overseas or domestic company) as ‘natural persons’. Table 1 presents the distribution of sales from January 2018 through October 2022 between overseas companies, domestic companies, and natural persons. By combining the OCOD and CCOD registries, we gain a view of the characteristics of an extra 25,803 transactions involving overseas companies, an improvement of coverage of roughly 25 per cent. Out of all purchases by overseas companies, roughly 68 per cent are from other overseas companies, indicating that this is largely a market that trades within itself.

Table 1: Property sales by buyer and seller type (January 2018 to October 2022)

Buyer–seller	<i>N</i>	%
Domestic company–domestic company	1,779,173	59.85
Domestic company–natural person	773,378	26.02
Domestic company–overseas company	15,436	0.52
Natural person–domestic company	311,255	10.47
Natural person–overseas company	13,058	0.44
Overseas company–domestic company	10,965	0.37
Overseas company–natural person	14,001	0.47
Overseas company–overseas company	55,395	1.86
Total	2,972,661	

Note: the table shows the distribution of property sales between different types of buyers and sellers, across both the CCOD and OCOD. We cannot directly observe transactions between natural persons.

Source: authors’ compilation.

⁷ The previous name for this database was Overseas Companies Ownership Data, hence the acronym.

⁸ The previous name for this database was Commercial and Corporate Ownership Data, hence the acronym.

⁹ <https://www.gov.uk/guidance/hm-land-registry-overseas-companies-that-own-property-in-england-and-wales>.

¹⁰ Information on individual owners of property in the UK is available, but must be requested on an individual basis and costs a fee per entry. The records are also not machine-readable, further driving up the cost of creating a comprehensive database of property ownership.

Second, we only observe the exact property sales date if the buyer is an overseas or domestic company, and thus information was included in our combined OCOD/CCOD registry. For all sales to natural persons, we only know the date the title registration was changed in either the OCOD or CCOD registry, which can lag the actual sales data by an average of 81 days. Because of this imprecision, in the current version of our analysis of sales by overseas companies we drop all sales to individuals.¹¹ As later updates to the Land Registry's OCOD and CCOD databases may affect our results in the future (as new purchases are registered with a lag), we explore in Appendix Section B2 how stable our results are to recent changes of the data.

Third, entries in each include all changes in the property title information, including both transfers of ownership between different actors and modifications made to address and legal name fields. To focus on actual sales, we exclude all title registrations where the actual owner (as indicated by either name or unique alphanumerical company ID) does not change.

Finally, our 'corporate property registry' includes information at the property title level rather than for actual buildings or properties. According to a spokesperson from the Land Registry, 'there may be more than one structure contained within a registered title' (Neate 2022a). To identify instances where titles contain multiple properties, we apply a set of algorithms developed by Bourne et al. (2022) to enhance the corporate property registry by first tidying the data so that individual properties are listed on each line, and then standardizing the address and locating the local authority for the property based on the system from the Office of National Statistics.¹²

At the beginning of 2022, there were between 170,000-180,000 offshore-owned properties in England and Wales (Figure 2).¹³ Throughout the analysis, roughly 80 per cent of these properties are owned by companies registered in tax havens. Many areas of England and Wales show a higher propensity towards offshore ownership (as shown in Figure 1). In the case of the City of London, more than 1 in 20 properties are owned by a company based in a tax haven. Despite that, purchases by offshore companies have been making up a smaller and smaller proportion of company purchases in the UK: Figure 3 shows the proportion of the total value of all company purchases (domestic + overseas) that are made by offshore companies, which flattened out around 10 per cent following the Russian invasion of Ukraine and dropped to close to zero in the months following the introduction of the Register of Overseas Entities.

3.2 Measuring price at the transaction level

In order to estimate our empirical models with price volume as the dependent variable and estimate the impact of the ECB on the amount of *dirty* money invested in real estate in the UK, we need data on the purchase price of all real estate transactions. Unfortunately, price data is not available for all transactions in our data. In our combined sample of real estate transactions from the OCOD and CCOD databases, 37.9 per cent of observations contain information on the prices paid by buyers.¹⁴ We add additional data on prices from the UK Land Registry Price Paid Data.¹⁵ This dataset contains title-level information on all property sales in England and Wales, including price paid and address. Merging in the additional price data, however, only reduces missingness by about 0.7 percentage points.

¹¹ Appendix Section B2 shows that the lag in reporting does not vary based on the jurisdiction of company buyers or sellers. In future versions of the paper we hope to use data on prices paid to recover many of the actual sales dates.

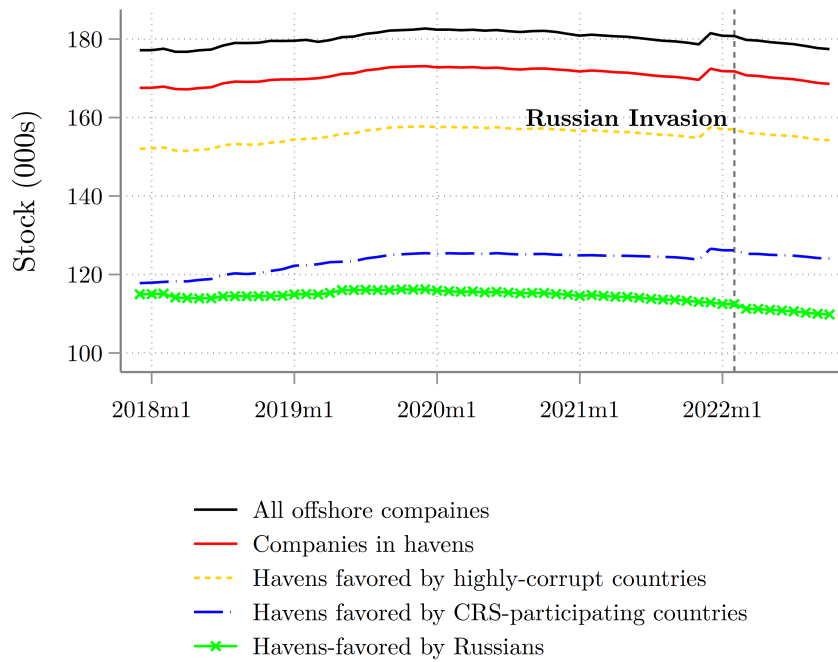
¹² Because the algorithms were designed for the OCOD, we adapted them to also take in the CCOD data.

¹³ There were approximately 100,000 offshore-owned titles at this point. Titles can encompass multiple properties.

¹⁴ This is quite similar to the missingness in price information reported by Bomare and Herry (2022), who note that only 36 per cent of transactions in their data include price information.

¹⁵ <https://www.gov.uk/government/statistical-data-sets/price-paid-data-downloads>.

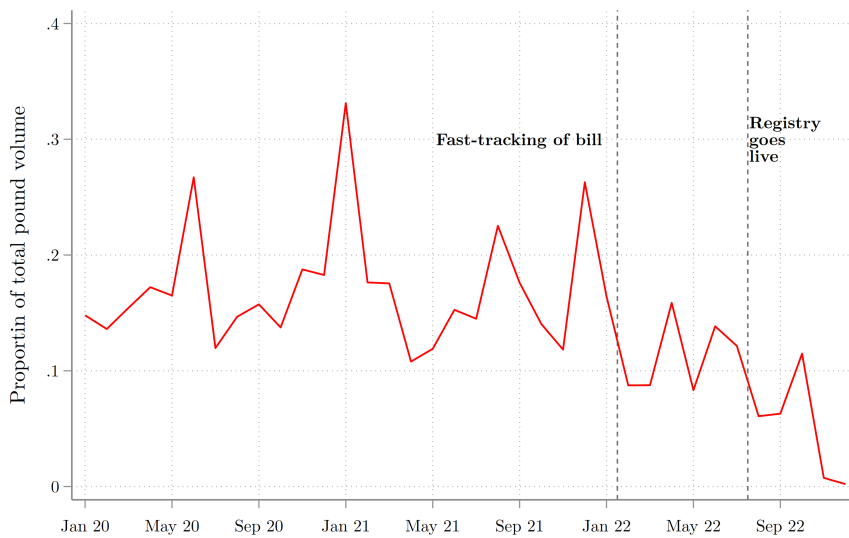
Figure 2: Trends in the stock of offshore ownership from 2018 to 2022



Note: this figure shows the estimated total number of properties in England and Wales owned by (1) offshore companies, (2) offshore companies based in tax havens, (3) offshore companies in havens that are preferred by those from countries at the 25th percentile or lower on the Corruption Perceptions Index, (4) havens preferred by Russians, and (5) havens preferred by residents of countries participating in the OECD CRS.

Source: authors' compilation.

Figure 3: Proportion of the total value of all company purchases made by overseas companies



Note: this figure shows the proportion of the total GBP value of all purchases made by companies in England and Wales that was made by offshore companies.

Source: authors' compilation.

To approximate prices for the remaining 61.4 per cent of transactions without price information, we follow Bomare and Herry (2022) and create a price prediction model. We estimate a linear regression model with prices paid (natural log) as the dependent variable and transaction-specific covariates, as well as including quarter and postcode district fixed effects.¹⁶ Based on a test set, excluded from the estimation, our price prediction model has a root-mean-squared error (RMSE) of 1.04 and a mean absolute error (MAE) of 0.67.¹⁷ We then use the estimated model to generate predictions for all transactions without price information.

Summary statistics for all purchases, sales, and stock information across both tax havens and non-havens are available in Table A1 in the Appendix.

3.3 Identifying jurisdictions that are tax havens and selecting those with different risk profiles

We begin by identifying overseas jurisdictions that are more commonly associated with illicit money flows and tax evasion. We primarily draw on a list of tax havens used in Menkhoff and Miethe (2019). For robustness, in the Appendix we also present our headline results using lists used by Johannesen and Zucman (2014) and a ‘consensus list’ used by both Menkhoff and Miethe (2019) and Bomare and Herry (2022).

To identify havens that are more popular among certain groups, we rely on data from the ICIJ Offshore Leaks Database,¹⁸ which comprises multiple leaks of offshore financial information (including both the Panama and Pandora Papers), including beneficial ownership information for over 500,000 individuals. Following a similar methodology to that of Bomare and Herry (2022),¹⁹ for a given group g and tax haven jurisdiction j , we calculate the total percentage of all identified beneficial owners, owners, and shareholders of companies based in jurisdiction j that are from group g , that is:

$$s_{gj} = \frac{n_{gi}}{\sum_{j=1}^k n_{gj}}$$

We focus on three groups of beneficial owners or shareholders:

- Those from highly corrupt countries (as measured by those who score below the 25th percentile in Transparency International’s Corruption Perceptions Index), under the assumption that these individuals are more likely to be using offshore companies to hide their beneficial ownership information.
- Those from countries currently engaging in the OECD’s CRS, as there is significant evidence that the introduction of the CRS led to a flight of financial wealth from tax havens into UK property (Bomare and Herry 2022).
- Russian nationals, for the purpose of disentangling the degree to which any changes observed in offshore ownership are driven by an attempt to evade sanctions, independent of the effect of beneficial ownership transparency.

¹⁶ For those transactions without postcodes, we estimate the postcode district fixed effect based on a ‘missing’ category, but we add additional fixed effects at the local authority level.

¹⁷ For comparison, Bomare and Herry (2022) report an out-of-sample RMSE of 1.128 and MAE of 0.683.

¹⁸ <https://offshoreleaks.icij.org/>.

¹⁹ We deviate from Bomare and Herry (2022) in that we use havens with a higher relative proportion of beneficial owners from a given group, rather than setting an absolute threshold.

For each group, we identify the upper quartile of havens with the highest absolute level of popularity for each of the three groups. The resulting breakdown for each group is shown in Table 2. There is overlap between the four lists. However, the share of beneficial owners from corrupt countries has no (or in the case of the bottom 25th percentile, a negative) correlation with the share from AEOI countries. The share of Russians is weakly correlated with both. These differences will allow us to investigate separately whether any decline in offshore ownership is being driven out of concerns of avoiding anti-corruption efforts or tax evasion.

Table 2: Tax havens with the highest share of different high-risk groups

Rank	CPI 25th percentile		Russian		CRS/AEOI signatories	
	Haven	% BOs	Haven	% BOs	Haven	% BOs
1	Liberia	25.00%	Gibraltar	12.50%	Grenada	100.00%
2	Saint Kitts and Nevis	23.08%	Cyprus	10.91%	Turks and Caicos Islands	100.00%
3	Gibraltar	18.75%	Bahamas	5.41%	Guernsey	88.06%
4	Cyprus	14.55%	Hong Kong	4.54%	Anguilla	72.33%
5	Guernsey	9.70%	Mauritius	3.53%	Isle of Man	71.14%
6	Hong Kong	8.55%	British Virgin Islands	2.52%	Cyprus	60.91%
7	Belize	8.47%	Seychelles	1.86%	Costa Rica	58.68%
8	Bahamas	7.56%	Belize	1.72%	Jersey	56.62%
9	Mauritius	7.53%	Jersey	1.53%	Gibraltar	56.25%
10	Malta	5.41%	Labuan	1.25%	Belize	55.42%

Note: the table shows tax havens (using the list in Menkhoff and Miethe 2019) ranked by the total percentage of beneficial owners and shareholders present in the ICIJ Offshore Leaks Database from each category: countries that score in the bottom quartile of the Corruption Perceptions Index, Russians, and non-tax haven countries that are signatories to the OECD's Common Reporting Standard for AEOI.

Source: authors' compilation.

3.4 Identifying local authorities in the UK with a high level of opaque ownership or foreign demand

The impact of the ECB may be more pronounced in places that have historically been a destination for suspicious wealth. To detect heterogeneous effects on both prices and domestic company purchases, we gather at the local authority level to determine which local authorities had a high level of tax haven ownership prior to the introduction of the ECB, and which ones were most favoured by foreign nations from the three groups discussed above (Russians, corrupt, and CRS countries).

To identify areas with a high percentage of tax haven ownership, we calculate the total number of properties held by tax havens using the OCOD as of January 2020 and divide it by the total property stock (residential + commercial) in 2020 for every local authority in England and Wales.²⁰ We flag local authorities as having a high level of tax haven ownership if they are in the top quartile for ownership as a percentage of the total stock.

To identify areas with a high level of demand from our three risk groups (Russians, persons from highly corrupt countries, and persons from countries engaging in the CRS), we use data from the Centre for Public Data (CPD) on ownership by natural persons of UK properties (Powell-Smith 2021). Obtained through a Freedom of Information (FOI) request, these data calculate the number of property titles registered to individuals with an overseas correspondence address, aggregated by the district where the property is located, as well as the name of each overseas country. The data cover the period 2010–21 at two-year intervals. Similar to the above exercise with tax havens, we identify local authorities as

²⁰ The calculation of the denominator is made using several different data sources described in Section A2.

having a (relative) high level of demand from each of the three groups if they are in the top quartile for ownership as a percentage of the total stock.

3.5 Measuring price at the local authority level

For local authority-level prices, we rely on data from HM’s Land Registry, which produces a monthly House Price Index, which includes both the geometric mean of property prices at the local authority level as well as a house price index value (out of 100). Summary statistics for local authority-level outcomes are available in Table A2 in the Appendix.

3.6 Measuring suspicious domestic companies

In the wake of Russia’s invasion, no additional transparency measures were applied to UK domestic companies, which since 2016 have had to submit beneficial ownership information to Companies House. However, the Companies House system has come under withering criticism for failing to combat fake, shell, and fly-by-night UK companies which serve as conduits for major illicit financial transactions (PA Media 2022). Following the introduction of the Overseas Register, criminal and corrupt actors might rethink using overseas companies to manage their real estate, and instead establish domestic companies. These companies are potentially quicker and cheaper to register, and given the substantial failings in Companies House capacity, easy to abuse for illicit activity.

Capturing this potential substitution requires data not just on properties acquired by domestic companies (the CCOD data), but also a measure to distinguish more and less suspicious purchases. If the ECA indeed compelled bad actors to rely more on domestic companies, we should see the effect concentrated among those with dodgy characteristics that have been repeatedly connected to money laundering. We develop two red flags for identifying suspicious domestic companies drawing on methodology developed by Global Witness, the UK NGO which first assessed the coverage and quality of the Companies House corporate registries (Global Witness 2013).

The red flags aggregate across a list of 12 characteristics, shown in Table A5, common to suspicious companies. We code a ‘narrow’ red flag based on only characteristics of company owners and officers, including whether they are located in tax havens or even reported at all.²¹ Our ‘broad’ red flag includes all companies under the narrow red flag, but adds those that are registered at a mass address, were incorporated less than three months before the property purchase, or declared that it had no beneficial owners.²² We use these red flags to calculate the number of properties in each local authority each month that have been purchased by a shell company likely facilitating suspicious flows into the UK.

4 Empirical framework

4.1 The impact of the ECB announcement on offshore investment in the UK property market

Our main focus is on estimating the impact that the reintroduction of the ECB and the eventual establishment of the Overseas Register has had on anonymous offshore investment in the UK property market. Our empirical approach will be a series of difference-in-difference estimations. First, we ex-

²¹ This data comes from the Register of People with Significant Control (PSC) related by Companies House: https://download.companieshouse.gov.uk/en_pscdata.html.

²² Data on addresses and incorporation dates come from the Basic Company Data product released by Companies House: https://download.companieshouse.gov.uk/en_output.html.

plore whether investment by offshore companies declined following the re-announcement of the policy in February 2022.

We do so by estimating standard difference-in-differences models. Consider the following specification:

$$\log(P_{it}) = \beta \times Haven_i \times Post_t + \theta_i + \gamma_t + \varepsilon_{it} \quad (1)$$

where P_{it} is the purchase/sale or stock of properties (either the number or the total GBP value) owned by companies registered in jurisdiction i at time t . The dummy $Haven_i$ is equal to 1 if the jurisdiction is a tax haven and $Post_t$ is an indicator equal to 1 on and after February 2022. The parameters θ_i and γ_t are jurisdiction and period fixed effects, respectively. The coefficient β indicates the relative difference in the stock of properties owned through havens versus non-havens in the period following the invasion of Ukraine and the announcement of the ECB. Note that our estimate β will not pick up on the impact on overall investment in UK property, but only the difference in investment between companies that are based in tax havens (under the presumption that the primary motivation for this route of investment is its lack of transparency) and those that are not.

We will also estimate the event-study version of equation (1), which is:

$$\log(S_{ie}) = \beta \times \sum_{k=-24}^8 Haven_i \times I[e = k] + \theta_i + \gamma_e + \varepsilon_{ie} \quad (2)$$

We will also investigate how these effects change when our treatment group is, respectively, havens that are favoured by Russians, those from highly corrupt countries, and AEOI-participating countries, as described in Section 3.3. In each case, we repeat specifications (1) and (2) while restricting the sample to tax havens (rather than all overseas jurisdictions) and—in turn—considering the treated group to be Russian-favoured havens, corrupt-favoured, etc., under the presumption that a change in investment behaviour that is driven primarily by one set of havens will indicate that the group has been particularly disincentivized to invest in UK property.

4.2 The impact on house prices

As there has been a robust discussion surrounding the impact that offshore investment has on local property prices (Badarinza and Ramadorai 2018; Cvijanović and Spaenjers 2021; Gorbach and Keys 2020; Sá 2016), we also investigate whether the changes in beneficial ownership regulation have led to reductions in UK house prices. To do this, we exploit heterogeneity in the pre-treatment level of tax haven penetration of property markets at the local level. Consider the following difference-in-difference specification:

$$P_{rt} = \delta \times X_r \times Post_t + \theta_r + \gamma_t + \varepsilon_{rt} \quad (3)$$

where the price level in local authority r at time t is allowed to differ for local authorities with different characteristics (X_r). In this case, X_r is a dichotomized measure of pre-treatment local attractiveness for tax haven property ownership based on the same variables as described above (local authorities at or above the 75th percentile for the percentage of properties owned through tax havens). So equation (3) estimates whether prices in local authorities with a high percentage of tax haven ownership fall following the introduction of the ECB relative to those with a low proportion of tax haven ownership. We also do this using our three other measures of foreign demand described above.

Price trends across local authorities differ substantially during our period of study. In particular, areas with a high degree of offshore ownership saw a steady downward trend in prices relative to those with low levels of offshore ownership. To account for this, we will estimate the results using entropy balancing methods to re-weight the sample (Cefalu et al. 2020; Hainmueller 2012). We do this using the following characteristics measured at the start of 2020: the average price paid for properties in the local authority, the local authority's population density, and which of five regions the local authority

falls under (one of these being London, which is particularly favoured by offshore ownership). We rely on a conditional parallel trends assumption: that for local authorities of a similar density, region, and pre-treatment price, those with differing levels of shell company penetration would have seen similar levels of price growth following the introduction of the ECB if the bill had never been introduced. This is more plausible, as at this point we are comparing local authorities with similar pre-treatment housing markets.

4.3 Measuring diversion into domestic UK companies

As discussed above, given the limitations of Companies House prior to the introduction of a bill to improve its ability to increase its enforcement efforts, there is some concern that the high level of attention given to investment via offshore companies may have led to diversion of investment through onshore companies. Conversely, the threat of new enforcement powers and the general chilling effect of the invasion of Ukraine may have also led to a decline in UK shell companies being used to launder money in the UK property market.

To test these two competing hypotheses, we estimate purchases by UK companies that are (1) flagged as suspicious and (2) not flagged as suspicious, in every UK local authority. We then estimate a triple difference-in-difference specification of the following form:²³

$$\log(S_{crt}) = \lambda \times \text{Suspicious}_c \times X_r \times \text{Post}_t + \gamma_{cr} + \sigma_{ct} + \theta_{rt} + \varepsilon_{crt} \quad (4)$$

where S_{crt} is the stock of UK property held by companies of either type $c = [\text{Notsuspicious}, \text{suspicious}]$ in local authority r at time t . The dummy Suspicious_c is equal to 1 for local authority-level purchases by suspicious companies. The parameter X_r takes on the same categories as in the price regression above, focusing on LAs with a higher proportion of tax haven ownership, popularity among Russians, etc.

The coefficient λ , therefore, is an estimate of whether areas that, before enactment of the ECB, were a larger target of offshore investment see substitution to ownership via suspicious-appearing UK companies.

5 Results

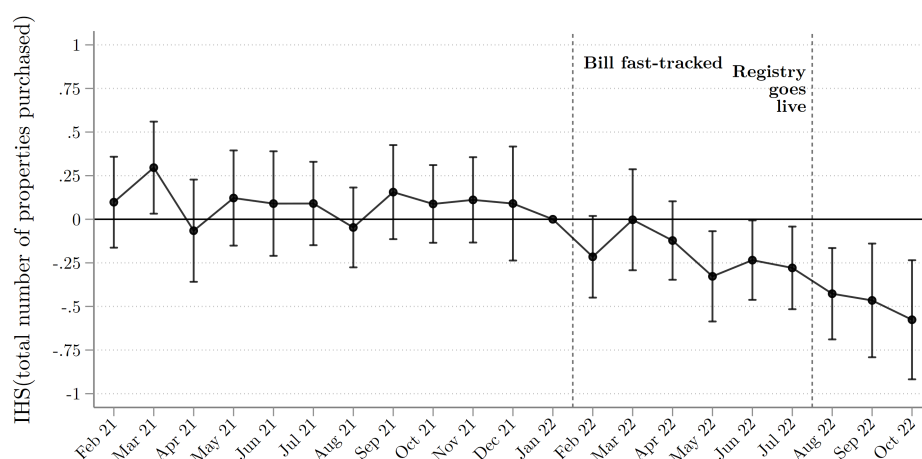
5.1 Investment and divestment through offshore companies

Figure 4 shows the event-study estimates (equation (2)) of the impact of the reintroduction of the ECB on the inverse hyperbolic sign of the total number of monthly purchases made through tax havens. In February, when the ECB was re-prioritized and the Russian invasion of Ukraine began, we observe an immediate drop in monthly sales, one that briefly recovers but then accelerates in May and drops further in August, when the Register of Overseas Entities went live and new buyers were required to register. The event-study coefficient for May 2022 is -0.327 , which implies a percentage change of approximately -28 per cent. We also find some evidence of an overall reduction in sales. While there is no immediate effect, and even a slight increase in sales occurring a few months after the introduction of the ECB, there is a slight reduction precipitating the establishment of the registry.

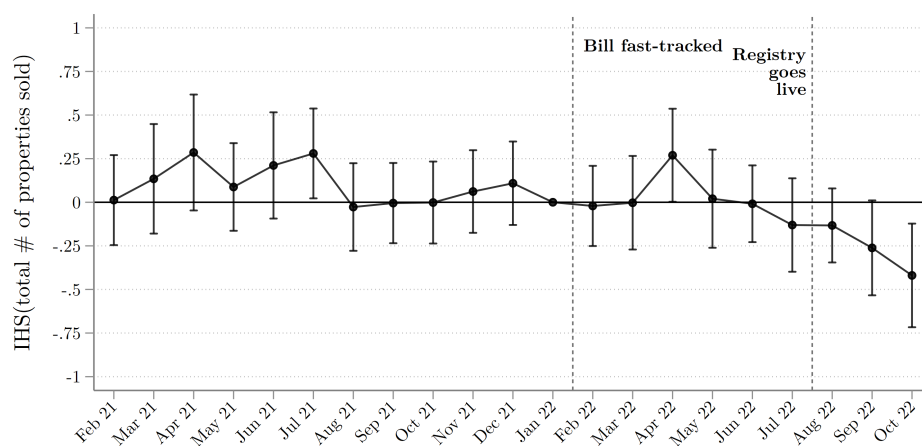
²³ This specification differs slightly from that which we specified in our pre-analysis plan. That is because, in error, we did not include all the relevant fixed effects for a triple-difference specification in the pre-analysis plan.

Figure 4: Event-study estimates of transactions involving tax havens following February 2022

(a) Purchases



(b) Sales



Note: this figure shows the impact of the Russian invasion + the announcement of the ECB on the inverse hyperbolic sign of (a) the monthly number of property purchases and (b) the monthly number of property sales in England and Wales by companies based in tax havens (the list used by Menkhoff and Miethé 2019) versus companies not based in tax havens. Sales numbers exclude properties sold to persons. Confidence intervals shown are at the 95 per cent level.

Source: authors' compilation.

Table 3 displays the difference-in-difference estimates for each outcome separately. Overall, purchases are significantly down in both number and value following the introduction of the ECB (by around 31 per cent in volume and 86 per cent in value, when we recalculated the coefficients into percentage changes). The probability of a purchase in any given month falls by about 12 percentage points. These effects are even more pronounced when we consider alternative lists of tax havens (Table B6 and Figure B1 in the Appendix). In total, when we re-estimate equation (2) using the absolute volume of purchases in GBP (after winsorizing to account for extreme values), we find that in the third quarter of 2022, the quarterly volume of property purchases through tax havens is approximately £52–90 million lower per haven than it was before relative to non-havens (see Figures 5 and B2). However, these results are sensitive to the inclusion of five havens²⁴ which made up around 80 per cent of the value of purchases in the third quarter of 2022. Dropping these, our estimates fall to approximately £2.7–3.5 million per haven per quarter. Our estimates of the overall quarterly decline in tax haven purchases are also highly sensitive to the inclusion of these havens, varying from £1.6 billion to £81 million.

²⁴ The British Virgin Islands, Guernsey, Jersey, Luxembourg, and the Isle of Man.

Taken together, these results suggest that the ECB has had a strong deterrent effect on investment in the property market via opaque offshore companies. It also suggests, through the more muted slow-down in sales, that the forestalling provisions in the bill may have—to date—prevented a large-scale sell-off of real estate. Even though the drop in purchases is notably higher than the drop in sales, we do not find any significant effects on the overall stock of properties being held (the final column of Table 3). This is because the overall change in investment so far has been small in comparison to the total stock of properties currently being held.

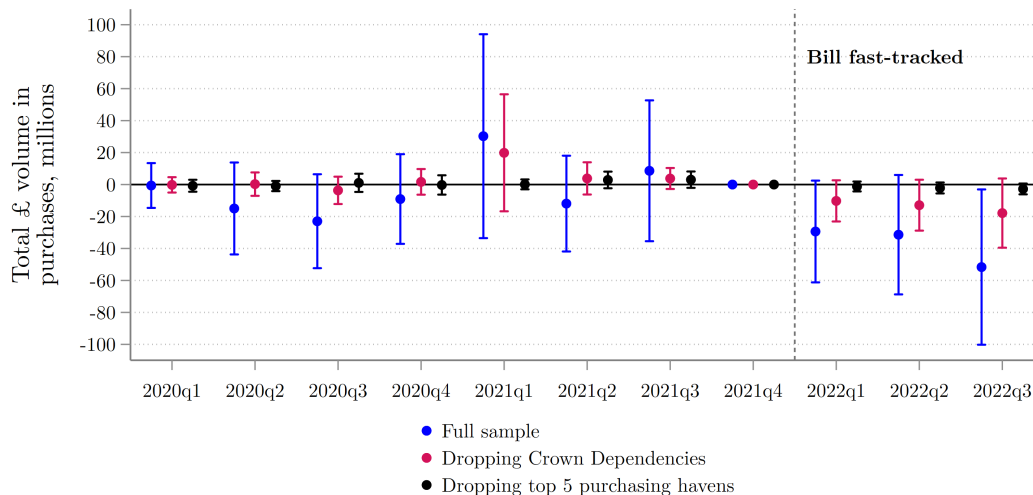
Table 3: Difference-in-difference estimates of impact on land transactions involving tax havens versus other overseas entities

	Purchases			Sales			Stock
	(1) ihs(count)	(2) any purchase?	(3) ihs(£ volume)	(4) ihs(count)	(5) any sale?	(6) ihs(£ volume)	(7) ihs(count)
Tax haven* × post-ECB re-tabling	-0.37*** (0.087)	-0.12*** (0.032)	-1.94*** (0.49)	-0.13** (0.052)	-0.030 (0.023)	-0.51 (0.35)	-0.022 (0.023)
R^2	0.771	0.587	0.641	0.749	0.571	0.619	0.998
Observations	4,422	4,422	4,422	4,422	4,422	4,422	4,422
# jurisdictions	134	134	134	134	134	134	134

Note: this table presents difference-in-difference estimates of new property purchases, new property sales, and the total stock of property ownership by offshore companies. The unit of analysis is a jurisdiction, and treated jurisdictions are tax havens (as classified by Menkhoff and Miethe 2019), with treatment beginning on February 2022, the month of the Russian invasion and the re-tabling of the ECB. Standard errors clustered at the jurisdiction level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: authors' compilation.

Figure 5: Estimated impact on total GBP volume of investment



Note: this figure shows event-study estimates of the impact of the Russian invasion + the announcement of the ECB on the total GBP value of all purchases by companies based in tax havens (the list used by Menkhoff and Miethe 2019) versus companies not based in tax havens. All values are winsorized at the 99 per cent level. Results in red indicate the estimated coefficients once Crown Dependencies (Guernsey, Jersey, and the Isle of Man) are dropped. Those in black indicate estimates when the other two top purchasers of property (Luxembourg and the British Virgin Islands) are also dropped. Confidence intervals shown are at the 95 per cent level.

Source: authors' compilation.

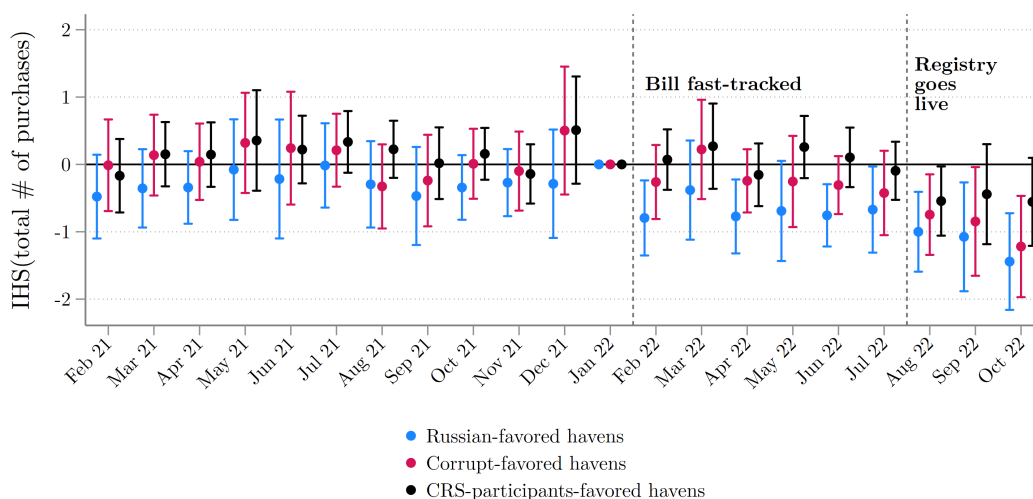
It should be noted that there is a brief increase in sales in the initial months following the introduction of the ECB. This raises some concerns that some owners exited the market early, and may not be planning to comply with the eventual registration requirements.

5.2 Investment and divestment through tax havens favoured by groups with different risk profiles

Figure 6 and Table 4 display the results when we estimate specifications (1) and (2) using the different groups of tax havens we specified earlier. Following the retabling of the ECB, we observe a strong and significant reduction in purchases via havens that are particularly favoured by Russians. We also see declines in purchases via havens favoured by those from highly corrupt countries and from CRS-participating countries, but neither show evidence of an effect until after the Overseas Register was established in August 2022.

Similarly, when we compare the overall difference-in-difference results in Table 4, treatment effects on purchases (but not sales) are strongest across the board for Russian- and corrupt-favoured havens. Our interpretation of this result is that the initial decline in investment may be partially driven not by a reaction to the introduction of the ECB, but a reduction in Russian investment either in initial anticipation of, or following the sanctions that took place in late February. However, the fact that we see an additional drop in purchases following the introduction of the Overseas Register does suggest that the ECB could be playing a role in deterring additional investment from all three groups.

Figure 6: Impact on investment through havens with different risk profiles



Note: this figure shows event-study estimates of the impact of the Russian invasion + the announcement of the ECB on the inverse hyperbolic sign of the monthly number of property purchases in England and Wales made through tax havens most favoured by (a) Russians, (b) residents of countries at the 25th percentile of the Corruption Perceptions Index, and (c) residents of non-haven countries that participate in the OECD CRS. The selection of havens—described in more detail in Section 3.3—is determined by the relative preponderance of beneficial owners in ICIJ’s Offshore Leaks Database. The control group are tax havens (the list used by Menkhoff and Miethe 2019) which are *less* favoured by these individuals. Confidence intervals shown are at the 95 per cent level.

Source: authors’ compilation.

5.3 Price effects

Figure 7 and Table 5 display the event-study and difference-in-difference estimates from specification (3), the impact of the reintroduction of the ECB on prices in local authorities with a higher level of exposure to tax haven ownership or higher relative levels of Russian/highly corrupt demand. Across the board we do not find any significant price effects for any of these groups. This may be driven by a number of factors: (1) the fact that the overseas market still makes up a small fraction of overall housing stock, even in local authorities with high levels of offshore ownership; (2) the fact that price effects are likely to be contained at the very top of the market, the effects of which are harder to pick up using average property prices; and (3) the fact that to date there has not been a significant sell-off of

Table 4: Difference-in-difference estimates of impact on land transactions involving tax havens of different risk profiles

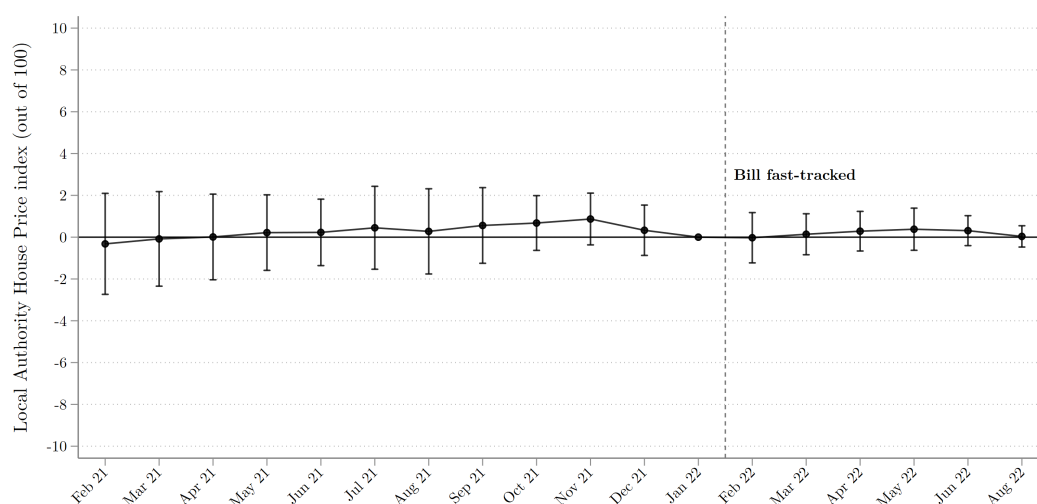
	Purchases			Sales			Stock
	(1) ihs(count)	(2) any purchase?	(3) ihs(£ volume)	(4) ihs(count)	(5) any sale?	(6) ihs(£ volume)	(7) ihs(count)
(1) Treatment = Russian-favoured havens Control = all other havens	-0.65*** (0.16)	-0.19*** (0.061)	-3.28*** (0.87)	-0.13 (0.12)	-0.011 (0.046)	-0.29 (0.72)	-0.0047 (0.021)
(2) Treatment = Corrupt-favoured havens Control = all other havens	-0.56*** (0.16)	-0.13* (0.061)	-2.13* (0.83)	-0.29* (0.12)	-0.043 (0.048)	-0.93 (0.71)	-0.0060 (0.022)
(3) Treatment = CRS/AEOI-favoured havens Control = all other havens	-0.28 (0.17)	-0.077 (0.068)	-1.16 (0.98)	-0.16 (0.12)	-0.062 (0.042)	-1.11* (0.61)	-0.0091 (0.024)
Observations	1,749	1,749	1,749	1,749	1,749	1,749	1,749
# jurisdictions	53	53	53	53	53	53	53

Note: this table presents difference-in-difference estimates of new property purchases, new property sales, and the total stock of property ownership by offshore companies from jurisdictions of different risk profiles. The unit of analysis is a jurisdiction, all of which are tax havens (as classified by Menkhoff and Miethe 2019), with treatment beginning on February 2022, the month of the Russian invasion and the retabling of the ECB. In (1) the treatment group are the top 25 per cent of havens that are most favoured by Russian beneficial owners as described in the ICIJ Offshore Leaks Database, with all other havens acting as the control group. The treatment group in (2) are havens favoured by individuals from countries that score in the bottom 25 per cent on Transparency International's Corruption Perceptions Index. (3) are havens that are most favoured by beneficial owners from CRS/AEOI-participating countries. Standard errors clustered at the jurisdiction level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: authors' compilation.

the housing stock owned by tax havens, indicating that the supply pressures on price may not manifest until (if) this takes place. Finally, our period of analysis comes at the start of a significant slowdown in the housing market, driven by increased interest rates. This suppression of sales across the country may leave less room for the effects of the policy to appear.

Figure 7: Event-study estimates of (non)impact of fast-tracking of ECB on the UK House Price Index in local authorities with high level of tax haven ownership



Note: this figure shows event-study estimates of the impact of the fast-tracking of the ECB on the UK House Price Index (relative to a base of 100), calculated by HM Land Registry. The unit of observation is the local authority, with treated local authorities being those at or above the 75th percentile for the proportion of all properties in 2020 owned by companies based in tax havens (using the Menkhoff and Miethe (2019) definition). Confidence intervals shown are at the 95 per cent level.

Source: authors' compilation.

Table 5: Difference-in-difference estimates of impact on land prices

	LAs with high % tax haven ownership		Russian-favoured LAs		Corrupt-favoured LAs		CRS-favoured LAs	
	(1) Price index	(2) Log(average price)	(3) Price index	(4) Log(average price)	(5) Price index	(6) Log(average price)	(7) Price index	(8) Log(average price)
DiD estimate	0.16 (1.12)	0.0020 (0.0074)	-0.22 (0.97)	0.000019 (0.0064)	-0.49 (1.46)	-0.0024 (0.0097)	1.12 (1.09)	0.0085 (0.0074)
R^2	0.918	0.996	0.924	0.997	0.914	0.996	0.915	0.995
Observations	10,890	10,890	10,890	10,890	10,890	10,890	10,890	10,890
# Local authorities	330	330	330	330	330	330	330	330

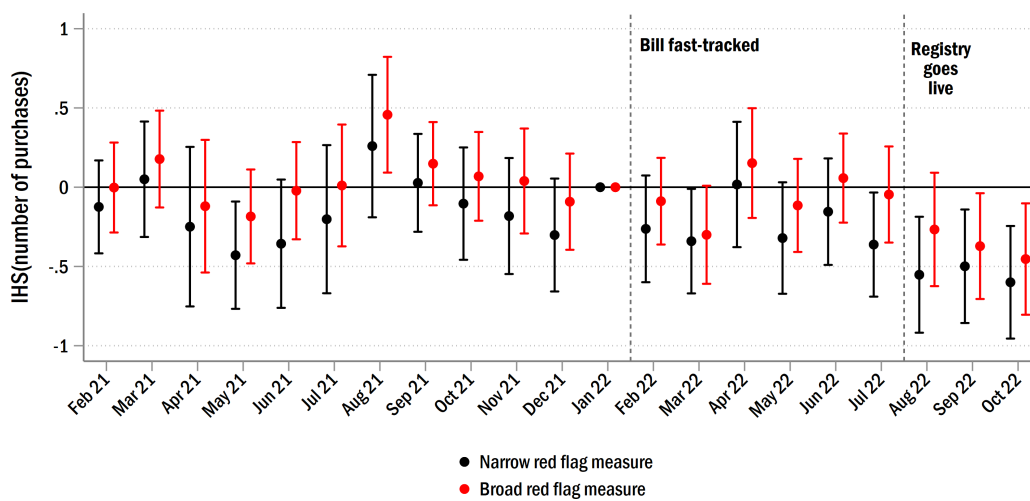
Note: this table presents difference-in-difference estimates of the impact of the fast-tracking of the ECB on (1) the UK House Price Index (relative to a base of 100) and (2) log(Geometric Mean of Property Prices) as calculated by HM Land Registry. The unit of observation is the local authority, with treated local authorities being those at or above the 75th percentile for (1) the proportion of all properties in 2020 owned by offshore companies based in tax havens (as defined by Menkhoff and Miethe 2019); (2) the proportion of properties owned by Russian individuals (as measured by CPD); and (3) the proportion of properties owned by individuals from highly corrupt countries (as measured by the Corruption Perceptions Index). Treatment begins in February 2022. The sample is reweighted using entropy balancing (Cefalu et al. 2020; Hainmueller 2012), balanced on the following 2020 characteristics: average price, log(population density), and region. Standard errors clustered at the jurisdiction level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: authors' compilation.

5.4 Changes in purchases through high-risk domestic companies

In this section we test for substitution/deterrence effects among high-risk domestic companies. Figure 8 shows event-study estimates of equation (4) for local authorities with a high proportion of tax haven ownership, for both firms identified using the broad and narrow red flag measures. No consistent effect is observed, although there is some sign of a relative decline in purchases starting in August. Similarly, Table 6 (and Table B7 in the Appendix) display the results across the different categories of local authorities: those with a high proportion of tax haven ownership, Russian-favoured, etc. While a few specifications indicate statistically significant effects, they do not appear consistently in any particular direction. Our conclusion is, at this stage, that there does not appear to be strong evidence that there has been a significant diversion of investment into suspicious high-risk companies, nor a significant deterrence effect on these companies purchasing property.

Figure 8: Triple difference event-study estimates of the (non)impact of the retabling of the ECB on purchases by suspicious domestic companies in local authorities with a high proportion of tax haven ownership



Note: this figure shows event-study estimates of equation (4)—triple difference estimates of monthly property purchases by UK-registered companies. The unit of analysis is a local-authority + transaction type (either made a low-risk or a high-risk one by the narrow or broad criteria set out above). Treated observations are purchases by high-risk companies in local authorities at or above the 75th percentile for the proportion of all properties in 2020 owned by offshore companies based in tax havens (as defined by Menkhoff and Miethe 2019) Confidence intervals shown are at the 95 percent level.

Source: authors' compilation.

Table 6: Triple difference estimates of the impact of reintroduction of the ECB on purchases by suspicious domestic companies in local authorities with different risk profiles (narrow red flag measure)

	X = LAs with high percentage of tax haven ownership			Russian-favoured LAs			Corrupt-favoured LAs			AEOI/CRS-favoured LAs		
	(1) ihs(count)	(2) ihs(£ volume)	(3) any purchase?	(4) ihs(count)	(5) ihs(£ volume)	(6) any purchase?	(7) ihs(count)	(8) ihs(£ volume)	(9) any purchase?	(10) ihs(count)	(11) ihs(£ volume)	(12) any purchase?
LA of type X.x												
high-risk purchase	-0.17** (0.068)	0.19 (0.32)	0.034 (0.024)	-0.13* (0.073)	0.27 (0.33)	0.041* (0.024)	-0.048 (0.068)	0.084 (0.32)	0.026 (0.024)	-0.072 (0.069)	-0.41 (0.32)	-0.017 (0.024)
R^2	0.880	0.764	0.689	0.880	0.764	0.689	0.880	0.764	0.689	0.880	0.764	0.689
Observations	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846
# Local authorities	331	331	331	331	331	331	331	331	331	331	331	331

Note: the table presents estimates of equation (4)—triple difference estimates of monthly property purchases by UK-registered companies. The unit of analysis is a local-authority + transaction type (either a low-risk or a high-risk one by the strict criteria set out above). Treated observations are purchases by high-risk companies in one of four types of local authorities: those at or above the 75th percentile for (1) the proportion of all properties in 2020 owned by offshore companies based in tax havens (as defined by Menkhoff and Miethé 2019); (2) the proportion of properties owned by Russian individuals (as measured by CPD); (3) the proportion of properties owned by individuals from highly corrupt countries (as measured by the Corruption Perceptions Index); or (4) the proportion of properties owned by those from AEOI/CRS-participating countries (with the exception of tax havens). Treatment begins in February 2022. Standard errors clustered at the local authority level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: authors' compilation.

6 Discussion

Before discussing why the ECB/ECA may have impacted overseas companies, we reiterate that due to the nature of the data analysed, our results may change in future versions of this working paper. We cannot rule out a lag in reporting title registrations to the authorities, and as we discuss in Section B2, updates to the data can affect future estimates of our treatment effect. Future versions of both the OCOD and CCOD data may include property sales that occurred throughout 2022, but were either initially reported without exact transaction dates or prices paid. We also do not yet know what will happen approaching or following the registration deadline at the end of January 2023. Therefore, we emphasize that both our findings and related discussions are preliminary and subject to change. As more data becomes available, we will update this paper accordingly.

6.1 Stalled property market

Our results show that the ECB has led to an effective stalling out of the offshore property market in the UK, with a sharp decline in purchases by companies based in tax havens. While many have been dissuaded from investing in UK property, other than a single month of increased sales there has not (yet) been a large-scale sell-off of property by shell companies in order to avoid the obligations ahead of the deadline to register. This may be driven by the forestalling provisions in the original bill: companies that sell after 28 February 2022 will still, in theory, have to enter their beneficial owner information into the register by 31 January 2023.

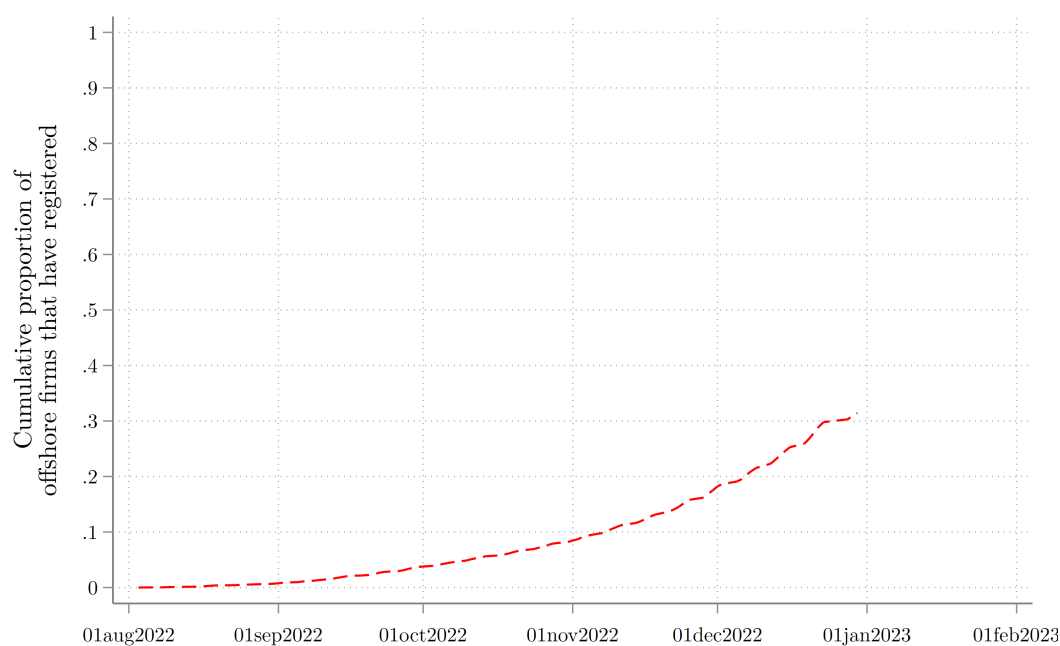
It thus remains to be seen what the ultimate impact of the policy will be: by our estimates, as of November 2022, at least £44–76 billion worth of property in England and Wales is still held by shell companies in tax havens.²⁵ It is unclear at this stage whether the owners of that property will comply with their upcoming registration requirements, or find some means of circumventing them.

Between the inception of the Overseas Register (1 August) and January 1 the Register of Overseas Entities contained entries for 9,974 unique firms. Our latest download from the OCOD database, on the other hand, contained information on 31,917 different overseas companies as proprietors in real estate transactions. Overall this implies that, by January 1st, of the firms listed as proprietors in the OCOD data only around 30 per cent have submitted data to the Register of Overseas Entities.

The fact that as of 1 January—with less than one month remaining—around 30 per cent of offshore owners have complied with the registry raises a concern that the remainder are either planning to be non-compliant or are taking the time to find new ways of obscuring their ownership. Figure 9 shows the timeline of registration so far, generously assuming that the companies we have failed to match are still part of the OCOD and so count towards the total completion rate.

²⁵ We estimate this by taking either the number of titles or the number of estimated properties held by tax havens in each local authority and multiplying it by the House Price Index's average price for that local authority. This is likely to be an underestimate as offshore investment is often premium investment. Note that this is a lower estimate than has been made by other organizations, such as Global Witness.

Figure 9: Proportion of overseas entities that have registered to date



Note: this figure shows the total number of entities that have registered with the Register of Overseas Entities to date, divided by the approximate number of offshore entities in the OCOD that—as of 4 January—own property in the UK.

Source: authors' compilation.

In addition to purchases prior to 1 August the ECB has clear instructions for more recent property transactions. All overseas companies that have purchased property since 1 August 2022 are eventually required to have submitted data on beneficial owners to the Register of Overseas Entities. Analysing data on the proprietors of property purchases registered since 1 August 2022, we identify 101 unique firms as proprietors. Out of these 101 companies, only 66 can be found in the Register of Overseas Entities (i.e. a registration rate of only 65 per cent). While this is a higher compliance rate compared to properties purchased prior to the August start date, absolute compliance is again relatively low.

For sales to increase, eager buyers also must emerge, in particular for luxury properties that are perhaps overvalued because of the opacity previously conferred. Table 1 also shows that the primary buyers of real estate assets owned by overseas companies are also *overseas companies*. Roughly one-half of all sales stay in foreign hands, suggesting there is a pocket of properties within the UK real estate market that are almost never owned by domestic persons or companies. The ECB may have so driven down demand for these properties that few existing owners are willing to sell.

6.2 Improved enforcement

The impact of the ECB in driving down real estate activity by overseas companies in the UK stands in contrast to a similar measure requiring beneficial owner transparency in the United States—the GTOs. First introduced in Manhattan and Miami in 2016 and ultimately expanded to 21 counties, the GTOs required corporate buyers of any real estate asset above certain price thresholds²⁶ to report their beneficial owners confidentially to the US government. Our previous work found little to no evidence that this programme had an effect on the buying behaviour of corporate entities since its introduction (Collin et al. 2021). What explains this divergence in policy outcomes across the two broadly similar real estate

²⁶ The thresholds varied by county and over time, ultimately being lowered across the country to US\$300,000.

markets? We argue the relative effectiveness of the ECB owes to money launderers perceiving a greater degree of enforcement of the regulation and thus wider scrutiny of suspicious purchases.

First, in the UK, the ECB created a public, permanent register of beneficial owners of overseas companies, drawing on an existing definition and infrastructure already applied to domestic companies. The Register of Overseas Entities is already live (as of 1 August 2022) and immediately available for browsing by journalists, investigators, and the general public. Fears of external scrutiny may have been especially heightened in the wake of Russia's invasion of Ukraine. For months, investigative journalists combed through UK public records in search of assets held by Russian oligarchs and individuals connected to Putin's war machine. The increased salience around the issue of the UK as a destination for illicit financial flows potentially changed the risk-reward calculus of initiating new real estate investments in the country. Although all corporate all-cash buyers of real estate had to submit roughly the same information to government authorities in the United States, the agency tasked with collection—FinCEN—has not shared publicly any of the ownership data and only in rare cases shared information with other US law enforcement agencies (GAO 2020).

Even if they had doubts about the ability of Companies House to verify data and conduct investigations, overseas companies considering purchasing property may have been wary of a public record of ownership records raising significant questions about the provenance of the money used for the real estate purchase. The ECB also made Unexplained Wealth Orders (UWOs) easier to obtain, enforce, and monitor, giving the UK government an additional tool to confiscate assets (Beioley and Hughes 2022). The introduction of the ECB 2.0 in the summer of 2022 also allocates additional resources and investigative authority to Companies House to monitor the Overseas Register, promising increased enforcement activity going forward. This intensifying external scrutiny combined with formal government attention to enforcement has effectively decreased interest among overseas investors to date.

6.3 Policy or invasion of Ukraine?

The ECB was fast-tracked as part of the UK's response to Russia's war in Ukraine over concerns about Russian money finding a safe haven in the West. That response included a battery of sanctions to freeze and even confiscate the assets of Russian oligarchs. Spooked by these actions, wealthy Russians may have significantly pulled back their investments in the UK real estate sector, not because of future concerns about beneficial ownership transparency, but because of the heightened political risk surrounding all forms of Russian money in the wake of the invasion. Figure 6 indeed shows that companies based in Russian-favoured havens more sharply curtailed their purchasing behaviour beginning in February 2022.

Our results indicate that Russian money avoiding the UK was not completely responsible for the drop in both purchases and sales of property by overseas companies starting in the spring of 2022. First, our categorization of Russian-favoured havens does not mean these jurisdictions are solely conduits for Russian investments. Even countries such as Gibraltar and Cyprus, where relatively larger numbers of Russian beneficial owners have been observed, see roughly 90 per cent of their investment from other country-nationals in Europe, the Middle East, Africa, and Asia. Additionally, we observe similar effects for purchasing activity by companies based in tax havens favoured by the corrupt, but not necessarily Russian investors. Though less precisely estimated, this downward trend also begins in the spring of 2022.

Most importantly, as Figure 4 shows, these declines accelerated slightly in August 2022, when the Register of Overseas Entities first went live. By that month, the political risk caused by the war had more or less already been priced into the market. Therefore, the further drop-off in interest of offshore companies after that point reflects the impact of the ECB independent of the war in Ukraine. This effect may be driven both by corrupt and Russian money avoiding the UK property market rather than by tax

evaders, as the effects are much more muted for havens dominated by residents of countries participating in the OECD’s CRS. This may be because those who are not reporting offshore property assets to tax authorities may not expect the register to be used against them, or because they expect their details will be less scrutinized by the public.

7 Conclusion

Using data available as of 4 January 2023, we find that the ECB led to substantial decreases in new purchases and sales of UK properties by companies based in tax havens, a clear sign that those wishing to anonymously invest in UK property view the policy as a threat. The large effects we have found stand in contrast to the implementation of a similar policy in the United States, likely driven by the fact that the reporting requirements have resulted in a public database that will be subject to public scrutiny as well as the presence of forestalling components that will—in theory—‘catch’ any investments or divestments made in the interim. Beneficial ownership transparency, a cornerstone of current efforts to reduce corruption, money laundering, and tax evasion around the world, appears to have a strong deterrent effect if implemented correctly.

However, as we have discussed, the success of the ECB and the Register of Overseas Entities will rest on its effective implementation once the registration deadline has passed. A significant amount of real estate owned by entities in tax havens has yet to fall into compliance, and it is unclear if the supervising entity—Companies House—will have the capacity to scrutinize the information that will be submitted by roughly 30,000 companies, or to track down those who do not comply. To date, compliance to submit information to the Register of Overseas Entities is quite low and the long-run effect of the bill may be different. In future versions of the paper we will analyse new data once it becomes available.

Additionally, future versions of the paper will investigate possible ways that bad actors can circumvent the policy and avoid disclosing accurate information about true beneficial owners. Analysts have highlight two such mechanisms that the ECB left open. First, owners of overseas companies only have to be disclosed if properties change hands. If, instead, the company which owns the property is itself sold to another company (or individual for that matter), the reporting requirements of the ECB are not triggered. To test whether this loophole is being exploited, we are collecting data from OpenCorporates about the officers and formation agents associated with overseas companies that own property. Significant changes in these company characteristics without evidence of titles being transferred could be evidence of evasion. Similarly we will use such data to track a second loophole about whether nominee arrangements are being exploited to shield owners from disclosing their identities.

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Appendix

A Data processing

A1 Summary statistics and tax havens

Table A1: Summary statistics for overseas transaction data (Jan 2020–Oct 2022)

	Non-havens	Havens
# purchases (monthly)	0.45 (2.39)	9.75 (80.63)
# titles purchased (monthly)	0.33 (1.64)	5.39 (21.27)
Any purchase? (monthly)	0.12 (0.32)	0.34 (0.47)
Total value purchases (monthly, £ millions)	0.83 (5.28)	16.82 (77.48)
# number of sales* (monthly)	0.45 (5.74)	6.97 (27.06)
Any sale? (monthly)	0.08 (0.27)	0.32 (0.47)
# number titles sold (monthly)	0.31 (3.89)	4.54 (16.41)
Total value sales (monthly, £ millions)	0.82 (10.38)	13.03 (51.07)
Total stock (monthly)	113.56 (297.34)	3,232.08 (9,806.39)
Total # titles (monthly)	93.18 (247.67)	1,714.34 (4,772.25)
Observations	4422	

Note: table presents jurisdiction-month level summary statistics for havens (using Menkhoff and Miethe (2019) measure) and non-havens. Sale data only includes sales to domestic or offshore companies, not natural persons.

Table A2: Summary statistics for local authorities

	Mean	SD	Min	p25	p50	p75	Max	N
Average price	268937.23	138182.75	89598.13	175727.53	236119.45	329013.22	1250691.25	330
Population density	1742.40	2615.25	25.00	225.00	630.50	2329.00	16237.00	330
% of properties owned through havens	0.47	0.74	0.00	0.17	0.32	0.53	8.43	330
% of titles owned by Russian individuals	0.00	0.01	0.00	0.00	0.00	0.00	0.14	330
% owned by individual from highly-corrupt countries	0.01	0.02	0.00	0.00	0.00	0.01	0.20	330
% owned by individual from CRS countries	0.28	0.42	0.00	0.12	0.17	0.28	5.60	330

Note: table presents local-authority level summary statistics (all estimates taken from Jan 2020).

Table A3: Lists of tax havens used in main analysis

Country	Consensus list	Menkhoff and Miethe (2019)	Wier et al. (2022)
Andorra		x	x
Anguilla		x	x
Antigua and Barbuda	x	x	x
Aruba		x	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	
Curacao	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	x
Monaco		x	x
Montserrat	x	x	x
Nauru		x	
Netherlands Antilles	x	x	x
Niue		x	
Panama	x	x	x
Samoa		x	x
San Marino		x	
Seychelles		x	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

Note: this table shows the lists of tax havens used in the main analysis. The Consensus List contains 30 countries compiled by Menkhoff and Miethe (2019) that most often appear in studies of tax evasion. The Menkhoff and Miethe (2019) list includes countries classified as tax havens in their analysis. The Wier et al. (2022) list includes countries classified as tax havens in their analysis.

Table A4: Lists of tax havens used in heterogeneity analysis

Country	Popular w/ Russians	CPI 25th perc.	CPI 50th perc.	AEOI signatories
Bahamas	x	x	x	
Belize	x	x	x	
Cyprus	x	x	x	x
Gibraltar	x	x	x	
Grenada				x
Guernsey		x	x	x
Hong Kong SAR China	x	x	x	
Isle of Man	x	x		x
Jersey	x			
Liberia		x	x	
Liechtenstein				x
Netherlands Antilles				x
Singapore	x		x	x
Turks and Caicos Islands				x

Note: this table shows the lists of tax havens used in the heterogeneity analysis. The Russian list identifies havens where a large proportion of beneficial owners of shell companies identified in the Offshore Leaks were Russian. The CPI 25th and CPI 50th lists identify havens where a large proportion of beneficial owners of shell companies come from countries that are listed in the 25th or 50th percentile of most corrupt countries according to TI's Corruption Perception Index. The AEOI list identifies identify havens where a large proportion of beneficial owners of shell companies come from countries that are signatories to the OECD's Common Reporting Standard (CRS).

A2 UK property ownership data

Both the OCOD and the CCOD datasets include information on unique titles changing ownership, rather than actual buildings or properties. According to a spokesperson, ‘there may be more than one structure contained within a registered title.’²⁷ To identify instances where titles contain multiple properties, we apply a set of algorithms developed by Bourne et al. (2022) to enhance the OCOD dataset by first tidying the data so that individual properties are listed on each line, and then standardizing the address and locating the Local Authority for the property based on the system from the Office of National Statistics. We adapt the algorithms to intake both the OCOD and CCOD data which suffer from the same limitations.

UK property stock data and the proportion of offshore ownership

Annual data on English and Welsh residential housing stocks come from StatsWales and the Department for Levelling Up, Housing and Communities respectively.^{28,29} Data on non-residential properties comes from the Valuation Office Agency’s list of the number of number of rateable properties taken from the Local Ratings List.³⁰

²⁷Neate, Rupert. ‘More than 138,000 Properties in England and Wales Owned by Offshore Companies.’ *The Guardian*, November 7, 2022.

²⁸<https://statswales.gov.wales/Catalogue/Housing/Dwelling-Stock-Estimates/dwellingstockestimates-by-localauthority-tenure>

²⁹<https://www.gov.uk/government/statistical-data-sets/live-tables-on-dwelling-stock-including-vacants>

³⁰<https://www.gov.uk/government/statistics/non-domestic-rating-stock-of-properties-2022>

A3 Red-flagging the companies house data

Table A5 shows summary statistics across the 12 criteria we use to create the ‘broad’ and ‘narrow’ red flag indicators for UK companies. To create these we combine data from Companies House’s Basic Company Data with its Persons of Significant Control (PSC) and Company Officers (CO) databases which lists any individuals or companies that exert control (i.e. ownership) over registered companies. We process the Basic Company Data by standardizing company addresses; for the first criteria (1), we then flag if a company was registered at any address alongside at least 100 other companies, so-called ‘mass addresses’ or company factories that have been shown to be used by money launderers.³¹ Next, we calculate the gap in time between the company’s incorporation date and the property purchase date to flag those created specifically to house the property.

We then parse the PSC and CO databases, cleaning and standardizing country names and matching to our directories of tax havens. We flag if companies had any PSC or officers listing tax havens on any of our three lists. Finally, we follow Global Witness in flagging any companies who had PSC that were listed on 50 total companies in the dataset as well as PSC that were trusts, given the vulnerability of that type of legal entity to money laundering concerns.³²

Our Broad Red Flag indicator takes a 1 if the company met any of the 12 criteria listed in the table; over 52 per cent of all companies in the database qualified, with the mass address and recent incorporation criteria driving that figure. Acknowledging that far from all companies registered at mass addresses or shortly before property purchase dates are engaged in suspicious activity, we code the Narrow Red Flag indicator based on criteria 4–12, which focus on the individual owners, officers, and other actors with control associated with the company. As a robustness check, we show results using both red flag measures.

Table A5: UK company red flags

Variable	N	Mean
(1) Was the company incorporated at any address with at least 100 other companies?	597626	0.032
(2) Was the company formed within three months of the property purchase date?	597626	0.049
(3) Did the company declare that it had no qualifying PSC?	597626	0.055
(4) Has the company failed to submit any Persons of Significant Control Reports?	597626	0.067
(5) Were there any PSC from the Menkhoff and Miethe (2019) list of tax havens?	597626	0.022
(6) Were there any PSC from the Johannesen and Zucman (2014) list of tax havens?	597626	0.021
(7) Were there any PSC from the consensus list of tax havens?	597626	0.019
(8) Were there any officers from the Menkhoff and Miethe (2019) list of tax havens?	597626	0.015
(9) Were there any officers from the Johannesen and Zucman (2014) list of tax havens?	597626	0.014
(10) Were there any officers from the consensus list of tax havens?	597626	0.01
(11) Were there any PSC that also were listed as a PSC of at least 50 other companies?	597626	0.006
(12) Were there any PSC that are trusts?	597626	0.001
Red Flag: Broad	597626	0.224
Red Flag: Narrow	597626	0.102

Note: this table shows the summary statistics for the indicators used to create the red flags based on Companies House data. PSC stands for Persons of Significant Control, the UK term that encompasses beneficial owners. The Broad Red Flag takes a 1 if a company met any of the 12 criteria listed. The Narrow Red Flag indicator takes a 1 if the company met any of the criteria in rows 4–12.

³¹Fitzpatrick, Jim. “Firms Linked to Crime Based Yards from Companies House.” openDemocracy, October 10, 2022.

³²Jolly, Jasper. “Campaigners Query UK Government’s Ability to Identify Oligarchs’ Assets.” The Guardian, October 3, 2022.

A4 Transaction level price prediction

As described above, we start with our data on all real estate transactions. We first fill in missing postal codes where possible. After adding additional price data from the UK Land Registry Price Paid Data, we are left with missing price data in 61.6 per cent of observations. Based on the price data available, we create two variables measuring quarterly average price, first at the postcode area level and then at the larger local authority level. Using the combined data, we then estimate a linear regression model with logged prices as the dependent variable. As independent variables, we include the following:

- a binary variable for the type of title purchases, i.e. this variable is coded one for properties with indefinite title transfer (*freehold*);
- number of quarterly transactions at the postcode area (natural log);
- average price level at the postcode area (or, if unavailable, at the local authority level);
- a categorical variable for the different combinations of types of buyer/sellers for each transaction: person, domestic company, or foreign company.

In addition, the model includes quarter fixed effects and postcode district fixed effects. For those observations with missing postcodes, we set the postcode district value to ‘missing’ and estimate a single fixed effect. Additionally, we add local authority specific intercepts for observations with missing postcode data.

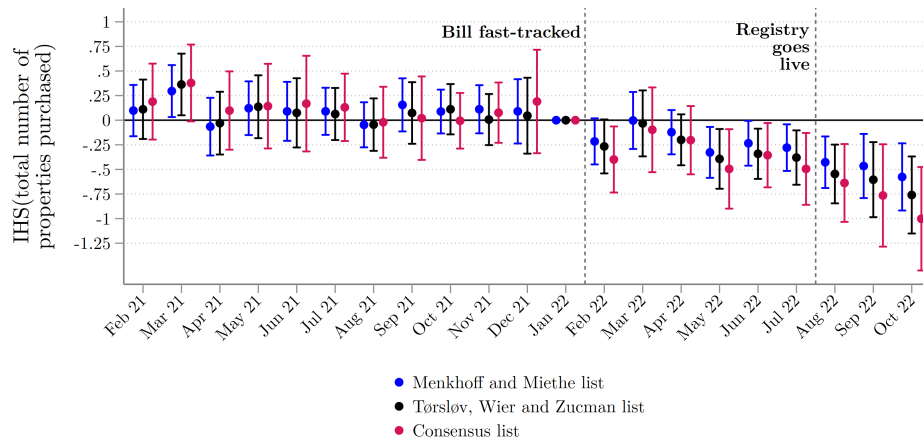
As noted in the manuscript, the estimated model is quite good at predicting prices. When training the model on 75 per cent of observations with price data and holding 25 per cent of data out as a test set, we achieve an out of sample predictive root-mean-squared error of 1.04 and mean absolute error of 0.66. We then estimate the model on all observations with price information and predict a price for all remaining observations.

B Robustness

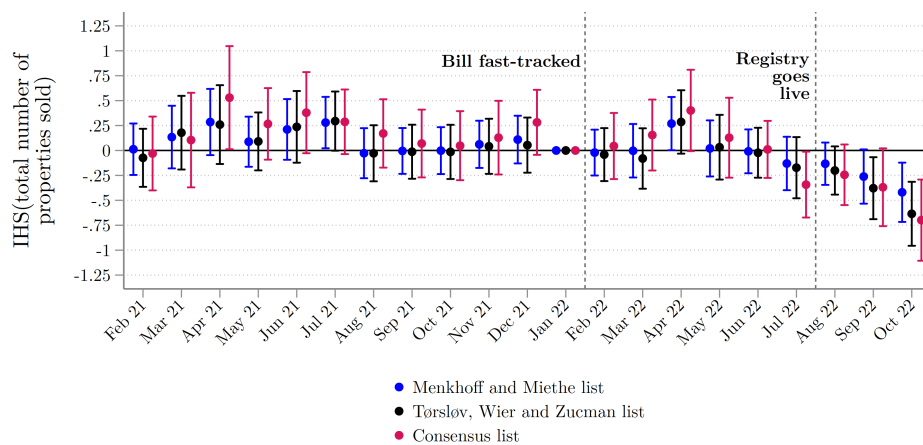
B1 Additional tables and graphs

Figure B1: Event study estimates of transactions involving tax havens following the reintroduction of the ECB (robustness across different tax haven lists)

(a) Purchases



(b) Sales



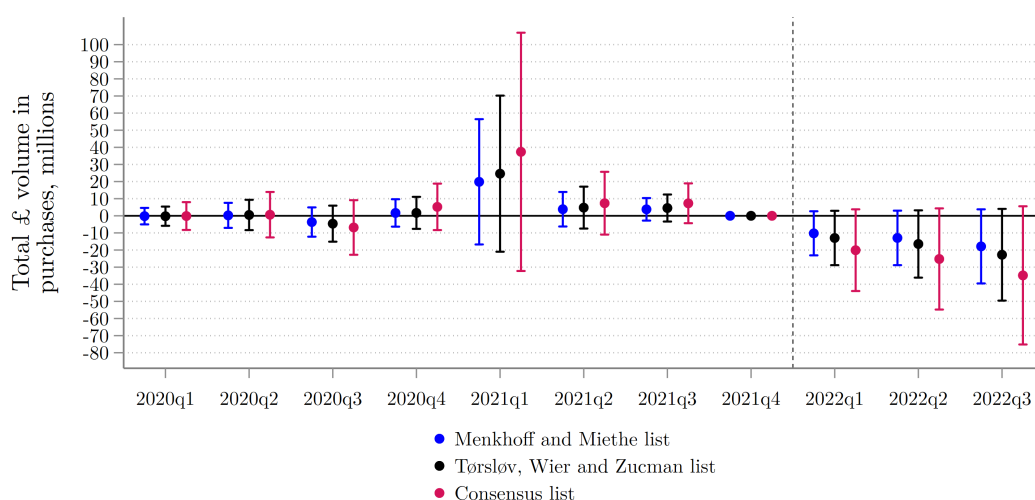
Note: the figure shows the impact of the Russian invasion + the announcement of the Economic Crime Bill on the inverse hyperbolic sign of (a) the monthly number of property purchases and (b) the monthly number of property sales in England and Wales by companies based in tax havens using three separate lists: (1) those chosen by Menkhoff and Miethe (2019), those chosen by (2) Tørsløv et al. (2020), and (3) a consensus list of jurisdictions that most commonly appear on tax haven lists, also compiled by Menkhoff and Miethe (2019). Sales numbers exclude properties sold to persons. Confidence intervals shown are at the 95% level.

Table B6: Difference-in-difference estimates of impact on monthly transactions involving tax havens (robustness using different definitions of tax haven)

	Purchases				Sales				Stock	
	(1) ihs(count)	(2) ihs(# titles)	(3) any purchase?	(4) ihs(£ volume)	(5) ihs(count)	(6) ihs(# titles)	(7) any sale?	(8) ihs(£ volume)	(9) ihs(count)	(10) ihs(# titles)
(1) Menkhoff and Miethe (2019)	-0.37*** (0.087)	-0.34*** (0.078)	-0.12*** (0.032)	-1.94*** (0.49)	-0.13** (0.052)	-0.098** (0.045)	-0.030 (0.023)	-0.51 (0.35)	-0.022 (0.023)	-0.019 (0.022)
(2) Tørsløv et al. (2020)	-0.45*** (0.100)	-0.41*** (0.089)	-0.14*** (0.036)	-2.32*** (0.55)	-0.17** (0.061)	-0.13* (0.053)	-0.047 (0.026)	-0.79 (0.41)	-0.024 (0.023)	-0.019 (0.022)
(3) Consensus List	-0.58*** (0.13)	-0.52*** (0.12)	-0.14*** (0.047)	-2.54*** (0.70)	-0.24*** (0.084)	-0.19** (0.074)	-0.041 (0.037)	-0.76 (0.56)	-0.033 (0.023)	-0.030 (0.023)
Observations	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422
# jurisdictions	134	134	134	134	134	134	134	134	134	134

Note: this table is an expanded version of Table 3, and presents different-in-difference estimates of monthly new property purchases, new property sales, and the total stock of property owner by offshore companies. The unit of analysis is a jurisdiction, and treated jurisdictions are tax havens—using different lists of tax havens—which treatment beginning in February 2022, the month of the Russian invasion and the re-tabling of the Economic Crime Bill. Number of titles = outcomes where we use the number of unique transactions on the land registry, rather than the estimated number of properties. Standard errors clustered at the jurisdiction level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure B2: Estimated impact on total £ sterling volume of investment, by different definition of tax havens (excluding top-5 largest investing jurisdictions)



Note: the figure shows event-study estimates of the impact of the Russian invasion + the announcement of the Economic Crime Bill on the total pound Sterling volume of purchases made (quarterly) by offshore companies. The unit of observation is the country of incorporation of the offshore entity and the treated group are tax havens. Each color represents a different list of tax havens: (1) those chosen by Menkhoff and Miethe (2019), those chosen by (2) Tørsløv et al. (2020), and (3) a consensus list of jurisdictions that most commonly appear on tax haven lists, also compiled by Menkhoff and Miethe (2019). Estimates exclude top 5 largest investing havens (British Virgins Islands, Guernsey, Isle of Man, Jersey, and Luxembourg). Observations are winsorized at the 99th percent level within countries. Confidence intervals shown are at the 95% level.

Table B7: Triple difference estimates of impact of re-introduction of ECB on purchases by suspicious domestic companies in local authorities with different risk profiles (broad red flag measure)

	X = LAs with high % tax haven ownership			Russian-favored LAs			Corrupt-favored LAs			AEOI/CRS-favored LAs		
	(1) ihs(count)	(2) ihs(£ volume)	(3) any purchase?	(4) ihs(count)	(5) ihs(£ volume)	(6) any purchase?	(7) ihs(count)	(8) ihs(£ volume)	(9) any purchase?	(10) ihs(count)	(11) ihs(£ volume)	(12) any purchase?
LA of type X × high risk purchase	-0.17*** (0.053)	0.43* (0.23)	0.054*** (0.017)	-0.11** (0.055)	0.40* (0.24)	0.047*** (0.018)	-0.044 (0.056)	0.41* (0.24)	0.046*** (0.018)	-0.037 (0.057)	0.038 (0.24)	0.014 (0.018)
R^2	0.871	0.765	0.679	0.871	0.765	0.679	0.871	0.765	0.679	0.871	0.765	0.678
Observations	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846
# Local Authorities	331	331	331	331	331	331	331	331	331	331	331	331

Note: this table presents triple difference estimates of monthly property purchases by UK-registered companies. The unit of analysis is a local-authority + transaction type (either made by a low risk or a high risk one by the broad criteria set out above). Treated observations are purchases by high risk companies in one of four types of local authorities: those at or above the 75th percentile for (i) the proportion of all properties in 2020 owned by offshore companies based in tax havens (as defined by (Menkhoff and Miethe 2019)) (ii) the proportion of properties owned by Russian individuals (as measured by CPD), (iii) the proportion of properties owned by individuals from highly-corrupt countries (as measured by the Corruption Perceptions Index) or (iv) the the proportion of properties owned by those from AEOI/CRS participating countries (with the exception of tax havens). Treatment begins in February 2022. Standard errors clustered at the local authority level.

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

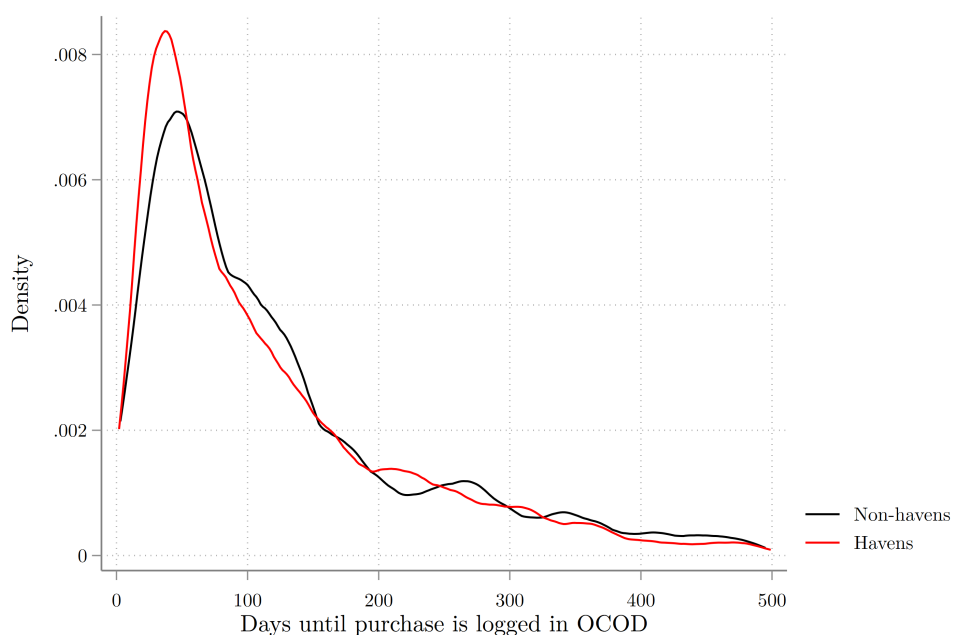
B2 Updating of the OCOD database

For any given property transaction there exists a lag between the date the property was purchased/sold and when it is entered into either the CCOD or OCOD. Across all transactions during our time period of interest (2018–22), the median entry appears 81 days (122 on average) after the actual transaction has taken place. This means that our estimates of recent trends of property transactions will be undercounting the true number and value of purchases, as some of those transactions will not yet have been lodged in the OCOD or CCOD.

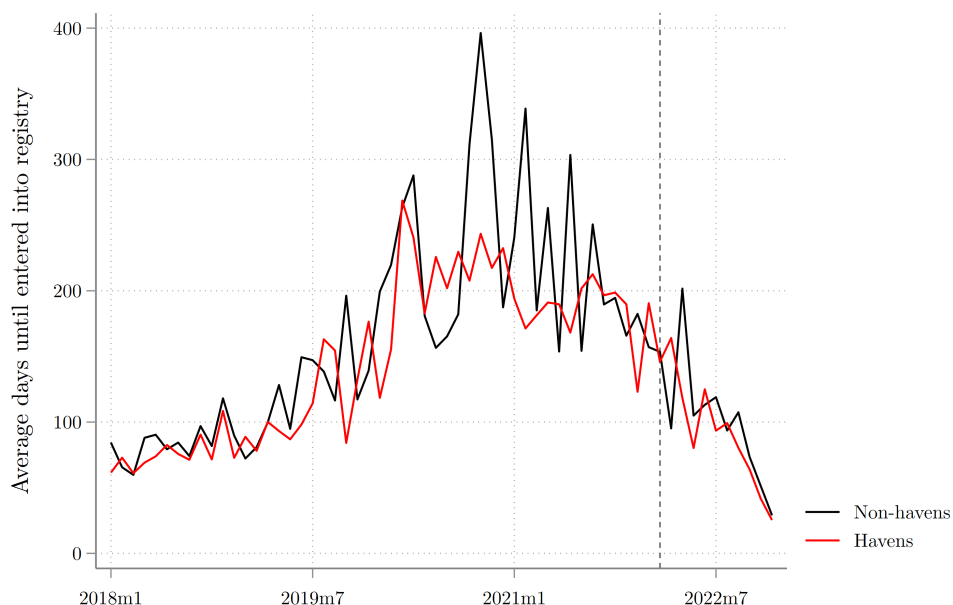
This would bias our results if, for instance, certain types of transactions were more likely to be lodged later than others—such as companies based in havens delaying the process of submitting the transaction longer than others.

To investigate this, we compare the difference in the ‘lag time’ (between the date the company was registered as an owner of the property and the date the transaction was posted to the OCOD) between companies based in tax havens and those based elsewhere overseas. There appears to be no difference in the distribution between the two groups, neither within the entire sample, nor across time (importantly, neither after the Russian invasion of Ukraine).

Figure B3: Delays in posting transactions to the OCOD, between tax havens and non-havens
(a) Overall distribution of reporting lag (2018-2022)



(b) Changes in average reporting lags across time

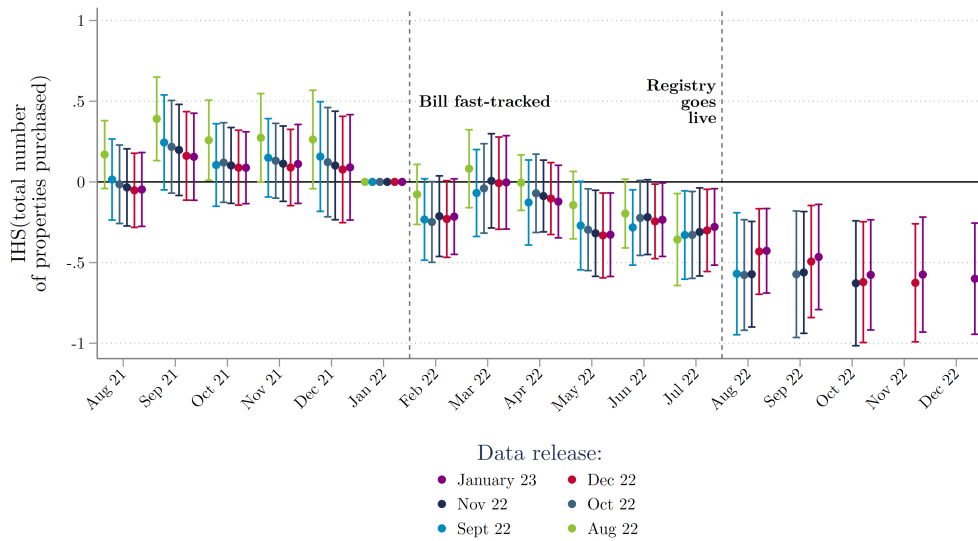


Note: Figure B3(a) displays the distribution of 'reporting lags' for every transaction in the OCOD database lodged between 2018-2021 for transaction lodged by companies based in tax havens (consensus list) versus non-havens (only transactions with a lag < 500 days are shown). The reporting lag is the difference between the registration date for the owning company and the date the transaction was lodged in the OCOD database. Figure B3(b) displays the average 'reporting lag' for transactions at a monthly level, divided between havens and non-havens.

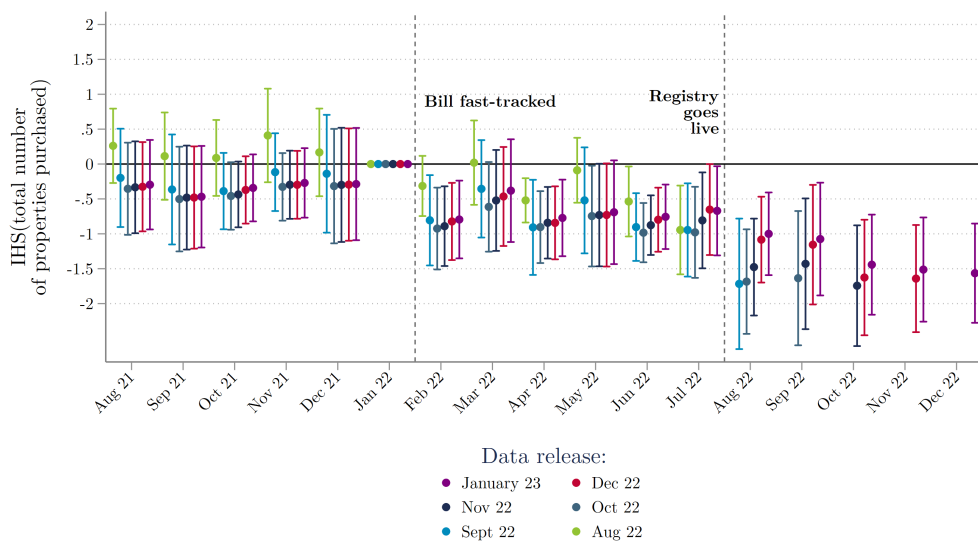
As a further robustness check, we examine what happens to our estimates if we 'rewind' the data release that we use for our analysis. That is, we re-run our main specifications using the December, November, September, and August 2022 releases of the OCOD database, to see if the addition of new transactions substantially changed our point estimates, had we run our specifications using earlier data. The results are displayed in Figures B4, B5, and B6. For purchases, we find that estimates in the vicinity of the introduction of the ECB are relatively stable. However we find that estimates following the introduction of the register have revised upwards, towards zero, as new releases are issued. Subsequent releases will reveal if these estimates are likely to stabilize or not. We find a similar result for our specification comparing Russian-favoured havens to other havens. We find a similar story when we observe the estimates of the impact of the total GBP volume of purchases.

By contrast, our sales results indicate a sharp upward revision as recent editions of the data have been released. Thus it is possible that the downward trend observed in the latter half of 2022 may continue to be affected by subsequent releases of the data.

Figure B4: Differences in event-study point estimates as Land Registry data is updated (purchases)
 (a) Changes in estimates of impact on IHS(purchases)

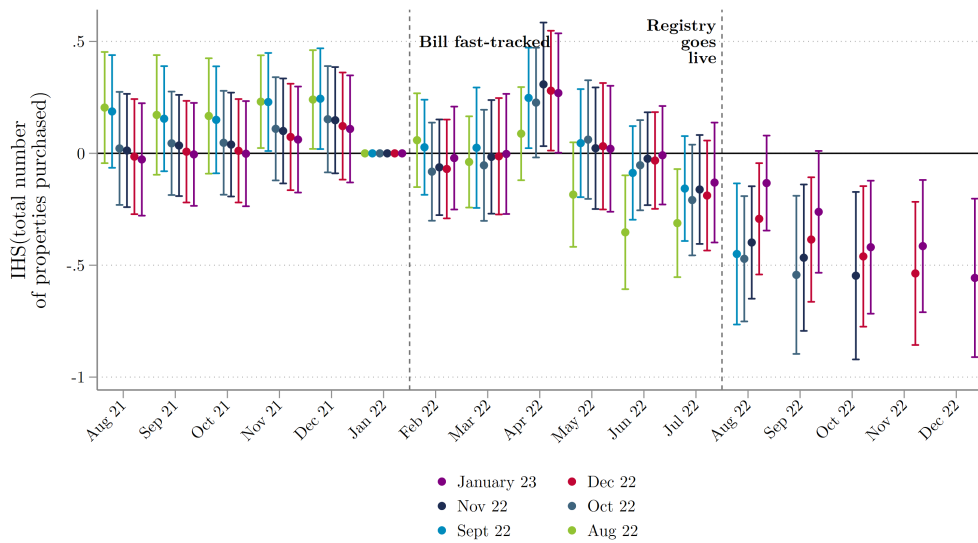


(b) Changes in estimates of impact on IHS(purchases) for Russian-favoured havens



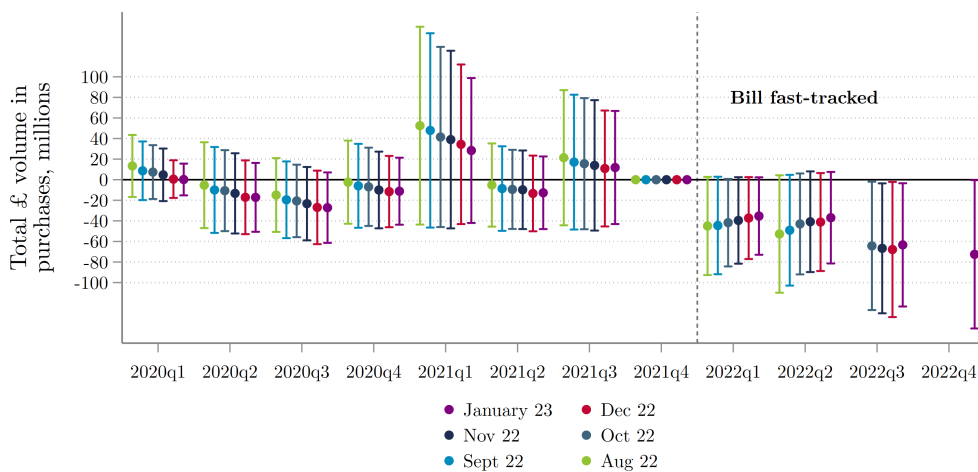
Note: the figure shows event study estimates of the impact of the Russian invasion + the announcement of the Economic Crime Bill on the IHS(number of purchases) made by offshore companies. The unit of observation is the country of incorporation of the offshore entity and the treated group are tax havens. Each color represents a different date of data updating (for example Nov 22 indicates that the estimates use data as recent as the November release of the OCOD from the Land Registry). Observations are winsorized at the 99th percent level within countries. Confidence intervals shown are at the 95% level.

Figure B5: Differences in event-study point estimates as Land Registry data is updated (sales)
(a) Changes in estimates of impact on IHS(sales)



Note: the figure shows event study estimates of the impact of the Russian invasion + the announcement of the Economic Crime Bill on the IHS(number of sales) made by offshore companies. The unit of observation is the country of incorporation of the offshore entity and the treated group are tax havens. Each color represents a different date of data updating (for example Nov 22 indicates that the estimates use data as recent as the November release of the OCOD from the Land Registry). Observations are winsorized at the 99th percent level within countries. Confidence intervals shown are at the 95% level.

Figure B6: Differences in event-study point estimates as Land Registry data is updated (value of purchases)
(a) Changes in estimates of impact on total purchase volume



Note: the figure shows event study estimates of the impact of the Russian invasion + the announcement of the Economic Crime Bill on the total pound Sterling volume of purchases made (quarterly) by offshore companies. The unit of observation is the country of incorporation of the offshore entity and the treated group are tax havens. Each color represents a different date of data updating (for example Nov 22 indicates that the estimates use data as recent as the November release of the OCOD from the Land Registry). Observations are winsorized at the 99th percent level within countries. Confidence intervals shown are at the 95% level.