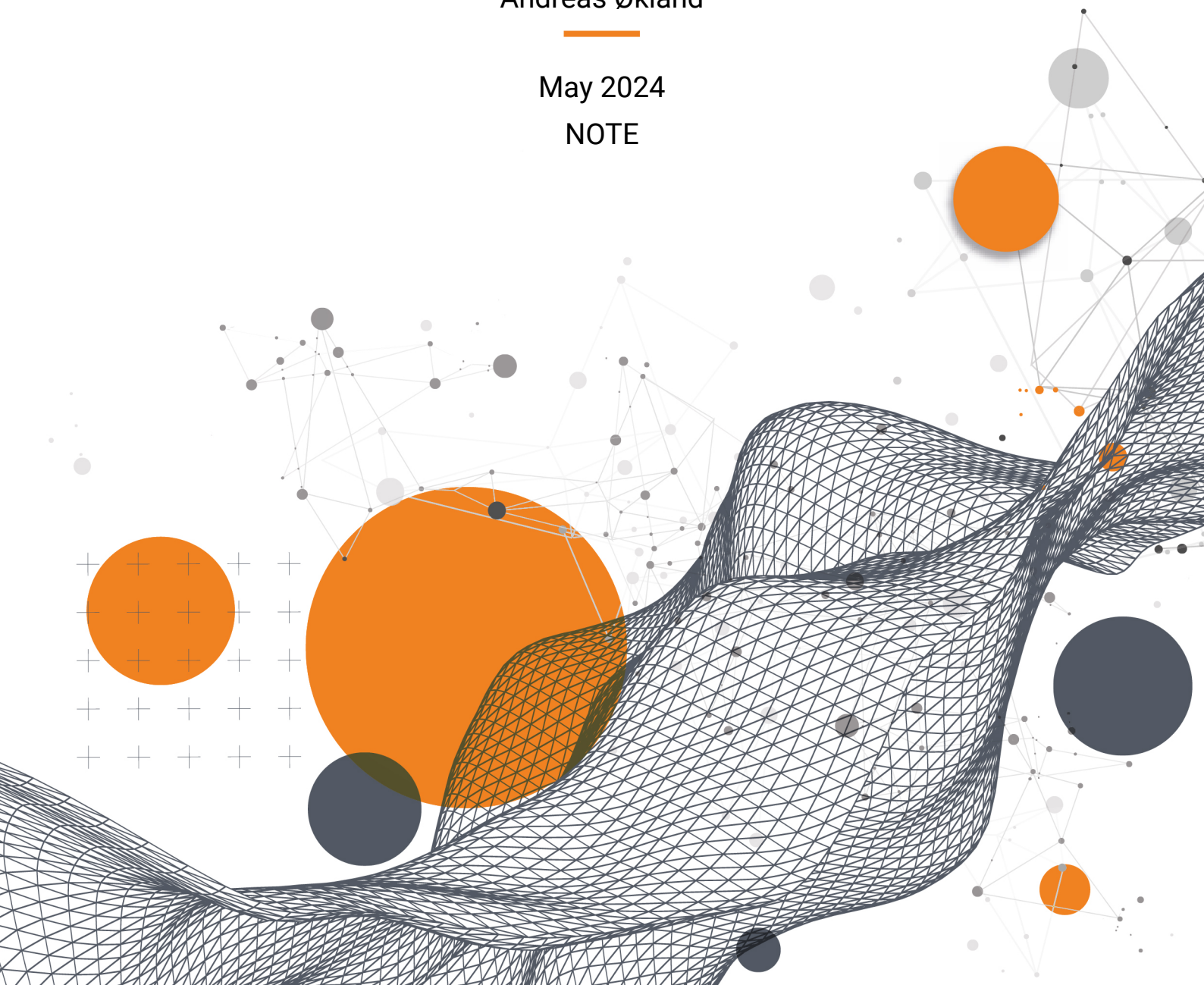


Foreign investment in the Dubai housing market, 2020-2024

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NOTE



Summary

This note presents new evidence on the scale of foreign investment in the Dubai residential property market. Using new data comprising the ownership of a large share of the Dubai property market, we present updated estimates of foreign-owned real estate for the years 2020 and 2022. We find that foreign nationals hold around 43% of the total value of all residential property in the city. Foreign-owned residential real estate grew by 20%—around \$23 billion—between the beginning of 2020 and early 2022.

We also find evidence of a substantial boom in Russian interest in the city following the invasion of Ukraine, with both utility accounts and residential leases associated with Russian nationals increasing sharply. Relying on simple assumptions to allocate new property purchases across nationalities, we conservatively estimate that Russians bought up to \$2.4 billion worth of existing properties and a further \$3.9 billion of in-development properties since the invasion.

Our findings have three main policy implications:

1. Anti-money laundering organisations such as the Financial Action Task Force should intensify pressure on the United Arab Emirates to clean up its real estate sector
2. Automatic exchange-of-information regimes such as the OECD's Common Reporting Standard (CRS) should be expanded to include real estate
3. Policymakers should begin the process of introducing the building blocks of a global asset registry, to build a unified picture of non-financial and financial assets, first at the regional level, then at the global level

Our updated 2020 estimates are also now available on the [Atlas of the Offshore World](#).

1 Introduction

Dubai has long maintained an open-door policy for foreign nationals looking to live and do business there. The emirate offers a combination of extremely favourable tax regimes,¹ free trade zones with little regulation, a liberalised property market, low cost residence-by-investment schemes and, during the pandemic, low restrictions on movement. As a result of these policies as well as a high demand for migrant workers, Dubai has become a city of foreigners: out of its more than three million inhabitants, only 8% are Emirati ([Dubai Statistics Center, 2022](#)).

At the same time, Dubai and the United Arab Emirates more generally have developed a reputation for acting as a global hub for illicit trade and finance ([Page and Vittori, 2020](#)). The city is reportedly a [major thoroughfare](#) for smuggled gold ([Lezhnev and Swamy, 2020](#)) and reporting by [journalists](#) and non-profits has highlighted the significant number of criminals and foreign politicians who have acquired high-value property there ([Kirechu and Vittori, 2020](#)). It has also, in part due to the UAE's abstention from imposing sanctions following the 2022 invasion of Ukraine, [reportedly](#) become a safe haven for much of Russia's sanctioned elite. In early 2022, as a result of growing concern over the UAE's role in facilitating illicit activity, the Financial Action Task Force (FATF) - an international anti-money laundering standard setter - added it to its watchlist of high-risk jurisdictions.² While the FATF recently decided to remove the UAE from the watchlist, as of the date of this report, the country remains on the European Union's Anti-Money Laundering blacklist.

This note outlines recent developments in one of Dubai's higher-risk sectors: its real estate market. Using confidential data on the ownership of a large number of properties in the city, we provide updated and expanded estimates of foreign-owned residential property across the city. We find that in 2020, foreigners owned approximately \$98 billion worth of Dubai residential real estate, an amount that grew to \$121 billion by the beginning of 2022. As a percentage of the value of total residential real estate, foreigners owned approximately 43% of the total amount, higher than any other city in the world that estimates are available for. We also provide country-by-country estimates, not only for the on-plan market, which comprises residential properties that are finished and ready-to-use, but also for the city's booming off-plan market, which are properties sold to interested buyers before a project is completed.

Using a combination of public data and assumptions about Russia's share of new property investments, we estimate the total Russian inflows into the Dubai real estate market in the two years following the full-scale invasion of Ukraine in February 2022. Importantly, we are able to verify our assumptions using confidential data on ownership, the last batch of which covers the first half of 2022. We estimate that Russians bought \$2.4 billion worth of existing residential real estate during the two years following the invasion, and a further \$3.9 billion of off-plan properties. This is roughly a 940% and 1,500% increase on the value of sales for the previous two years. This is a gross estimate - we do not yet have

¹The UAE famously levies no income tax on its residents, and only recently introduced a corporate income tax.

²Reportedly, one of the concessions required by the FATF was the introduction of a service that lets interested parties inquire whether a person is a real estate owner in Dubai, which appeared on the Dubai Land Department website between December 2022 and January 2023. <https://dubailand.gov.ae/en/eservices/inquire-whether-a-person-owns-a-property-overview/#/>

enough information on how many properties Russians likely sold during this period, but it does suggest a dramatic increase in gross inflows.

This analysis is an expansion of the analysis first presented in the EU Tax Observatory Working Paper #1, “Who Owns Offshore Real Estate? Evidence from Dubai” [Alstadsæter et al. \(2022\)](#) which also included estimates for 2020. The estimates in this note differ from those because they draw upon new data sources and methodological improvements and focus on residential real estate only. Specifically, we use publicly accessible data to better clean and identify types of properties in the original data, differentiate between on and off-plan properties, and include Emirate-owned properties. In our original report we were limited to treating the confidential data as being comprehensive, whereas in this version, we are able to better ensure it is representative. In the original report, we found that around 27% of all real estate in the confidential data was foreign-owned. In our new report, we focus only on *residential* real estate, expanding our estimate to the entire city, and find that the share rises to 43%, even as the total amounts being recorded fall (from a market of \$533 billion to \$224 billion in 2020). This is because of the removal of commercial real estate, but also the removal of empty lands, off plan properties and cancelled projects from the main estimate.

The scale of foreign investment in Dubai’s real estate market does not only have implications for the city itself but has important implications for the ability of foreign governments to tax their citizens or effectively enforce sanctions. In previous work, we showed that - among Norwegian taxpayers who invested in Dubai property - less than 30 percent of income and wealth related to that real estate was reported to the tax authorities, highlighting the ease with which a foreign taxpayer can use real estate investments to escape taxation back at home ([Alstadsæter et al., 2022](#)). At the same time, the presence of property owners from countries recently under direct or indirect sanctions, including Russia, Syria, Iran and North Korea, highlights the degree to which the UAE’s noncompliance with sanction regimes allows targeted individuals and governments to continue to thrive.

To the rest of the world, the Dubai property market is a black box. In this work, we have made an effort to open that black box, to reveal the size and scale of foreign-held real estate. But in reality, it underscores the need for better multilateral solutions to help foreign authorities better tax their citizens and track assets. We will discuss these in more detail in the conclusion to this note.

The estimates we present here will also be made available on the EU Tax Observatory’s [Atlas of the Offshore World](#), our online data platform that contains estimates on offshore real estate investments for seven different cities and areas around the world. The results published in this note will be included (and refined further) in an updated working paper published in the next few months.

The rest of the note proceeds as follows: in Section 2 we describe recent developments in Dubai’s real estate sector, relying primarily on public data provided by the Dubai government. In Section 3 we discuss the confidential and public data we use to estimate the share and size of foreign-owned real estate, as well as our methodology for doing so. In Section 4 we present our results, both in aggregate and for individual countries, for both 2020 and 2022. Section 5 presents our estimates for Russian inflows into the property market following the invasion of Ukraine. In Section 6 we discuss our results and policy implications.

2 Background: Dubai's Residential Real Estate Sector

Dubai's real estate and construction sectors are important drivers of economic growth in the city, currently comprising approximately 14% of GDP (Dubai Statistics Center, 2021). Real estate is also an important source of government revenue: while there is no individual income tax or estate tax and a low corporate income tax was only recently introduced, there is a 4 percent transfer tax on real estate and a yearly property tax of 5 percent of the annual rental value of the property (10 percent for commercial properties) (Deloitte, 2024). In addition, the sale of government-owned land for developments is also an important source of income (Ali, 2010).

Dubai's property market has seen rapid growth in the last two decades. Official statistics published by the Dubai Statistics Center indicate that between 2011 and 2021 the number of housing units grew from 445,000 to 780,000, an increase of 75%. By contrast, the housing stocks of New York and London both increased by only 9% over a similar period.

Despite this extraordinary growth in the housing stock, Dubai has seen strong residential price growth following the housing crash of 2009. The official house price index published by the DLD, shown in panel (a) of Figure 1, indicates that after a slump during the late 2010s and initiation of the COVID-19 pandemic, there has been a recent surge in prices, now approximately 25% higher than they were at the start of the pandemic. The boom in prices is mirrored by a surge in activity: between 2020 and 2023, the value of sales of on-plan (finished) properties grew by 350%. Off-plan sales, which occur when buyers put down money for a not-yet-existing property that will be part of a finished development, increased by 680% in value.

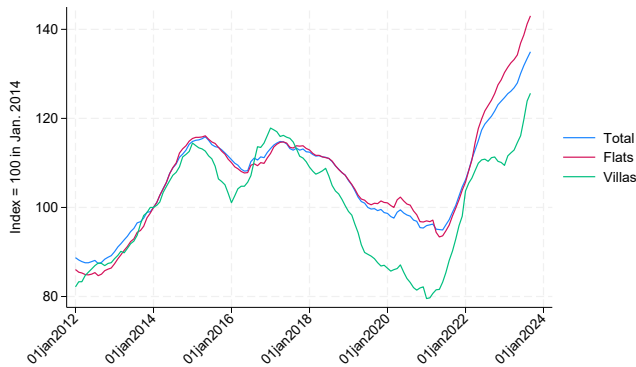
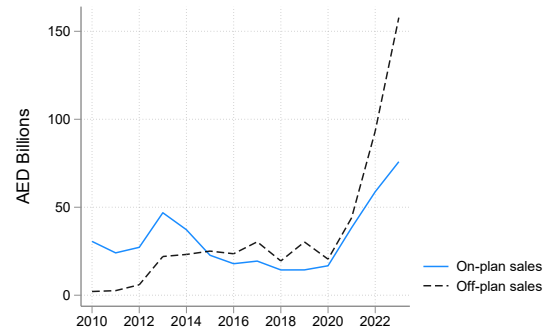
Below we highlight some of the trends and policy decisions that play a role in the rapid development of Dubai's real estate sector over the past two decades.

Extension of property rights to foreigners: Foreign ownership of real estate in Dubai only became a reality in 2002 when the government announced that foreign nationals would be given the right to own property for specific projects. This degree was later solidified with the introduction of regulations which designated specific plots of land in the city on which freehold or leasehold properties could be acquired by non-Gulf Cooperation Council foreign nationals.³ With subsequent decrees, the government has gradually expanded the number of neighbourhoods that allow for freehold ownership over time. Today, in conjunction with Dubai's economic free zones (where foreigners also have freehold rights) over 60% of the residential units in the city allow for some form of foreign ownership.⁴

The golden visa program: The United Arab Emirates announced a Golden visa program in November 2018, implementing it the following year. The program grants residency to individuals who make a substantial investment in the UAE, predominantly high net worth individuals, and other individuals that fall

³Before this point in time, only other Gulf Cooperation Council (GCC) nationals (UAE, Saudi Arabia, Qatar, Kuwait, Bahrain, Oman) were allowed to hold property.

⁴Authors' own calculations using data published by the Dubai Land Department on the Dubai Pulse website. Residential units include villas, apartments and hotel rooms/apartments.

FIGURE 1**Dubai Residential Real Estate Price Growth and Transaction Values Over Time (2010 -2023)****(a) Residential Sales Price Index****(b) Value of Residential Transactions**

Notes: Subfigure (a) plots the official Dubai house price index, published by the Dubai Land Department, over the period January 2012 to September 2023 (the last date of publication). The values are indexed to be 100 in January 2014. Subfigure (b) shows the total value (in AED, 1 AED is pegged to 0.272 USD)) of annual residential sales as reported by the Dubai Land Department, separately for on-plan properties (properties that had already finished construction) and off-plan properties (those that have yet to be finished). **Source:** Dubai Pulse, author's calculations.

under the category of having a specialized skill or entrepreneurial talent.⁵ The initial program granted residence to individuals and their families for 5 years, with the option of renewal, if the applicant owned real estate worth at least AED 5 million (USD 1.36 million). The real estate could not be mortgaged. Alternatively, investors could receive a 10-year residence permit if they invested at least AED 10 million in shares of Emirate companies or investment funds.

The government altered the residency-by-investment program in 2022 to make it more attractive. First, the length of the initial residence permit was extended from 5 to 10 years. Second, the price threshold for real estate investments was lowered from AED 5 million to AED 2 million (USD 540k) and it was allowed for the properties to be mortgaged via approved local banks.⁶ Third, it also allowed for investment in 'off-plan' properties, properties that are not yet built. The change was announced in April 2022, but not implemented before in October 2022. Around the same time, a scheme that granted owners of real estate worth AED 750,000 (USD 204,000) a 3-year residence permit (later reduced to 2 years) was introduced. The rules were again liberalized this year, as the down-payment requirement was removed. Now, all real estate worth at least 2 million dirhams (USD 0.54 million) qualifies for a residency permit.

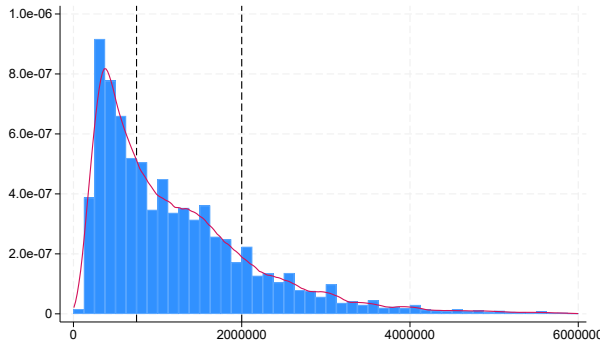
⁵When applying to local investments, these schemes are called residency-by-investment program in 2019. See [Langenmayr and Zyska \(2023\)](#) for an overview of the phenomenon and implications for tax compliance

⁶In these cases, a down-payment of at least 1 million dirham (USD 272,000) was required.

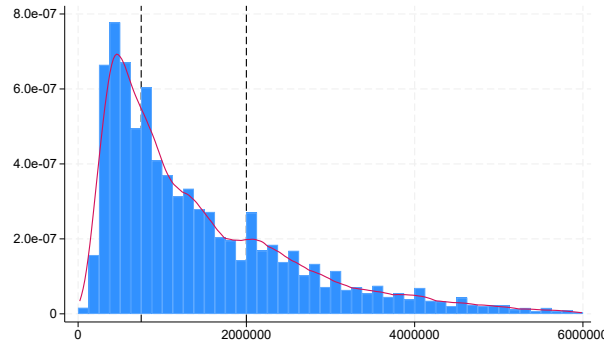
FIGURE 2

Transaction Prices for Existing (On-Plan) Residential Real Estate in Dubai, Before and After Changes to Residency-by-Investment Scheme

(a) 2018-2021



(b) 2023-2024



Notes: This figure shows the distribution of sales prices in the Dubai residential real estate market. The data on sales prices are obtained from the Dubai Land Department, which publishes anonymized transaction records for all real estate transactions. Subfigure (a) shows this distribution for the years 2018 to 2021. Subfigure (b) shows it for the full year 2023 and the months January to April 2024. Each vertical line shows the price thresholds of AED 750k and 2m needed for accessing a 2-year (or 5-year) residence permit from 2022 and onwards.

Preliminary evidence suggests that the UAE residence-by-investment scheme may be affecting transaction prices on the margin: Figure 2 illustrates how the 2022 announcement of new price thresholds (of AED 750,000 and 2 million) has led to bunching of residential sales above those thresholds.

Post-covid surge in activity: The UAE's pragmatic approach to the COVID-19 pandemic has been raised as a factor in the recent economic growth in Dubai, underlined by the 25 percent increase in house prices since the start of the pandemic. In December 2021, the Wall Street Journal wrote about how "[Sky-High Vaccination Rates and Zero Taxes Make Dubai a Pandemic Boomtown.](#)" The story points to how Dubai, in the period after the rate of infection had peaked in January 2021, enacted relatively modest restrictions, in contrast to other large cities like Singapore and Hong Kong. An important factor in this is that the level of vaccinations reached critical mass early and was among the world's highest throughout the pandemic ([Mathieu et al., 2021](#)). This allowed Dubai to [welcome tourists at a level approaching its pre-pandemic highs](#) during the fall of 2021, while other large cities across the world continued with new restrictions. According to the property consultancy firm CBRE, Google mobility data showed 20% more activity in retail and recreational activities in Dubai in late 2021 compared with before the pandemic.

Open-door policy towards Russia: Russia launched a full-scale invasion of Ukraine in February 2022. The invasion led to a wave of condemnation and sanctions from the rest of the world. Sanctions - primarily levied by the US, European Union and the United Kingdom - involved both restrictions on trade with Russia as well as the sanctioning of individuals and their assets. By contrast, the UAE remained friendly to Russia, continuing to act as a "playground" for its elite [in the initial months](#) following the invasion.

Reporting highlighted how Russian private jets that typically bounced between Moscow and various European cities before the war, [quickly made Dubai their destination-of-choice](#) after the invasion.

The UAE's open-door policy to the Russian elite following the invasion is likely to have had further ramifications for Dubai's property market. In Section 5 we will explore further how Russian investment in the market has likely changed since the beginning of the war with Ukraine.

3 Foreign-Owned Real Estate in Dubai: Data

In this section, we will present our updated methodology to estimate foreign-owned real estate in Dubai. While the Dubai Land Department both publishes detailed aggregate statistics on the real estate sector, as well as detailed microdata on the status characteristics of specific properties, buildings and lands in the city, it does not publish any information on foreign ownership of property, neither at the individual property level nor in aggregate.

However, as we will describe below, we have access to several datasets at the individual property level that we use to estimate the amount of foreign held property in the city, as well as the breakdown by each nationality, both directly (by adding up the value of properties visible in the data we have access to) and indirectly (by inferring foreign property ownership rates in areas of the city we have less data coverage for).

Property ownership data: For the purpose of this research we were provided with two property-level micro datasets by the Washington-based non-profit organization C4ADS. According to C4ADS, these datasets are sourced from the Dubai Land Department and other public utilities companies and cover a snapshot of real estate ownership across the city.⁷ These data are not publicly available and were shared with C4ADS by confidential sources that have not been made known to us. The records include detailed information on ownership and property characteristics on the full Dubai property stock, including the property's size, details, location, and use of the property. Individual owners of properties are usually recorded, including their names and nationality. The measures taken to ensure data and privacy protection are described in our online [Data Protection and Ethics Statement](#).

The first dataset, which we refer to as Sandcastles 2020 (or SC2020), records real estate ownership in Dubai as of approximately 2020. The second, more recent dataset, Sandcastles 2022 (or SC2022), covers real estate ownership in early-to-mid 2022. The first dataset was first analyzed in the paper [Alstadsæter et al. \(2022\)](#), where we used it to estimate overall foreign-held real estate across the entire city. The second dataset is less complete, and we will explain below how we use it to construct credible estimates for early 2022.

Data cleaning: Our full data-cleaning process for SC2020 is outlined in the original working paper ([Alstadsæter et al., 2022](#)). In this updated work, we adjust our cleaning strategy in several ways.

First, we match Sandcastles to microdata published by the Dubai Land Department on the Dubai Pulse

⁷<https://C4ADS.org/multimedia/the-C4ADS-dubai-property-database/>

platform. We do this both directly using identifiable property characteristics and indirectly using property identifiers provided to us in confidence by journalists, having obtained it from other sources.⁸ We do this in order to improve our ability to identify duplicates in Sandcastles and appropriately assign the value of the property.

Second, we better identify property usage and then restrict the analysis to focus only on properties we can verify are residential units: villas and flats (apartments), hotel rooms and hotel apartments. We do this because our ability to match commercial property to public sources for verification is more restricted and also because there is less coverage of these types of properties in the transaction data we use to assign prices. However, we may expand the analysis to commercial properties again at a later date.

Third, we drop lands, both to avoid double counting (i.e. both land and the property that sits on it) and because distinguishing ownership of built-up lands is often not possible.

Fourth, we identify and separate off-plan properties, those that have not yet been built, from the rest. While off-plan properties are of interest, they are not directly comparable to on-plan properties. This is because the physical property does not yet exist and no title has been issued – all that has happened is money has changed hands from a prospective owner and a developer. We also have no data on how much money may have changed hands: while we can observe if an off-plan property is valued at \$2m, we cannot observe how much of a down payment the buyer has made yet. While on-plan properties can be viewed as the stock of real estate, off-plan thus can be viewed as a kind of flow measure of future real estate. We use public data sources from Dubai Pulse to identify which properties were off-plan as of 2020 or 2022. We also remove properties from projects that have been cancelled.

Finally, we improve our ability to impute missing information in SC2020, by using unique combinations of characteristics (e.g., a nationality linked to only one specific combination of name and mobile phone number, or a neighbourhood that is associated to a unique municipality number) to better complete the dataset.

These changes are all implemented to improve our estimates using the Sandcastles 2020 data. Unfortunately, the second dataset, Sandcastles 2022, covers only approximately 60% of the properties as in the first dataset and has less complete information at the property level. We overcome this drawback by merging the two datasets using a common property identifier, as well as utilizing third-party data sources provided to us by journalists.

Estimation of the nationality of property owners: We construct the nationality of each property's owner by building on the information in the raw data. Because nationality is more easily observable than residency in these data, we focus on classifying property owners by nationality, while noting that nationality is not always the same as residency, that people can have multiple nationalities, and that data limitations mean we may sometimes capture residency as opposed to nationality. We proceed as follows.

For properties owned by individuals (the majority of properties in SC2020), we rely on the nationality information that is provided in the raw data. For more than 90% of the properties owned by individuals,

⁸We are not permitted to identify the source at this time.

nationality can be directly identified in this way in SC2020. If nationality is missing, we impute it using information in the data on the passport number, phone number, email address, and address of the owner, as well as public sources.⁹ In some cases, there is a possibility that we capture residency as opposed to nationality (e.g. properties owned by Syrian nationals who live in Jordan might sometimes be assigned to Jordan).

Next, we assign the country to the properties owned by firms. Our guiding principle is then to try to identify the nationality of the beneficial owners of these firms.

Because we aim at capturing nationality, our country classifications must be interpreted with care when analyzing the tax implications of offshore real estate. With few exceptions (e.g., the United States), taxation is based on residency, not nationality. This is the case in particular for Norway. Our analysis of the Norwegian sub-sample in [Alstadsæter et al. \(2022\)](#) shows that several individuals in our data who have Norwegian citizenship are not residents of Norway and thus not taxable there. The analysis of the fraction of Norwegian-owned Dubai real estate that evades taxation takes this fact into account.

Having established nationalities at the property level in both SC2020 and SC2022,¹⁰ We then generate city-wide estimates. First, we use our merger between the public microdata published by the DLD and the Sandcastles datasets to identify the share of the market that is covered by the latter. For properties that appear in both datasets, we use the nationality information from Sandcastles. For properties that appear only in the DLD microdata, we impute nationality information from properties in the same neighbourhood that only appear in Sandcastles when available.¹¹

For our 2022 city-wide estimates, we have to grapple with the lower coverage of Sandcastles 2022. There are two sets of properties we need further information to predict nationality shares for: (i) properties in SC2020 that have since been sold and are not featured in SC2022 and (ii) new properties that have been built and sold since 2020 and either do not feature in SC2022 or feature but without ownership information. For both of these groups, we need to estimate the share of sold properties bought by each nationality. To do this, we use information from properties we observe in both datasets that changed hands in the same neighbourhood. The intuition is as follows: if in a given neighbourhood, French nationals were the final owners of 10% of the value of all properties that changed hands for properties visible in both SC2020 and SC2022, we assume that French owners acquired 10% of the value of the properties that changed hands (or were newly built) that were absent in Sandcastles 2022. For properties that are in neighbourhoods that are entirely missing in Sandcastles 2022, we use the city-wide nationality shares instead of neighbourhood-specific nationality shares. This approach has one drawback: if neighbourhoods with lots of new developments have very different nationality dynamics

⁹The sources and algorithm used to conduct these imputations are detailed in [Alstadsæter et al. \(2022\)](#).

¹⁰For SC2022, if nationality information is missing, but not the name/other identifying information, we import it from SC2020. For properties where no information is available in SC2022, we first check whether the property has been sold since 2020 using transaction data provided to us by journalists. If the property has not sold, we assign it the same nationality as before. If the property has been sold, we impute nationalities using a method described below.

¹¹Our assumption is that nationality distribution for unmatched properties in Sandcastles are representative of unmatched properties in the public microdata. When a neighbourhood appears in the public microdata but not in Sandcastles, we use data on rental contracts, also provided to us by journalists, which allow us to observe what share of landlords are from each nationality (up until end-2020), under the assumption that each nationality lets out their properties with equal probability within a given neighbourhood. For neighbourhoods we have no further information about, we code these as unknown.

(e.g. Russian buyers have an out-sized presence in a new project compared to its ownership in existing parts of the city), then this will not be captured in our approach.

Finally, we discovered that Sandcastles only appears to cover properties that have freehold or leasehold title associated with them. This means that just aggregating properties from these datasets would leave out the significant share of real estate in parts of the city where foreign ownership is not possible. However, those properties are visible in the public DLD data, so we include them in our new estimates.¹²

Computation of property values: To compute property values for the final estimation, we rely on two approaches. The first is to use an individual property-level transaction dataset which is linkable directly to Sandcastles using a common identifier.¹³ When the matching is successful, we value the property using the closest transaction price to January 1st 2020 (or 2022). For the rest of the sample that does not appear in the linkable transaction data, we calculate the value $V_{i,t,g}$ of a property i of type t located in neighbourhood g as:

$$V_{i,g} = S_i \cdot P_{tg} \quad (1)$$

where S_i is the size of the property and P_{tg} is the average square meter price in district g .

S_i and the district of the property is observable in the raw data. P_{tg} is calculated using a publicly available dataset of comprehensive but anonymized property transactions in Dubai. The data is compiled by the Dubai Land Department and published through the Dubai Pulse portal. For 2020, we use the average square meter price for residential properties sold between January 2018 to December 2020 for each combination of neighbourhood and type, and inflate or deflate prices to January 2020 using the DLD's residential sale index (separately for flats and villas). We winsorize the average square meter price per type of property at the 5% and 95% levels. When estimating per-square-meter prices, we attempt to match to the most precise combination of neighbourhood and type for which there are at least 5 transactions. First, we try to match transactions within the same project and of the same type, then within the same project only, then within the same master project and of the same type, then within the same master project, then within the same area and of the same type, then within the same area, and finally of the same type only.

For 2022, we follow the same approach, using the average square meter price for residential properties sold between January 2020 to December 2022 for each district. If we are able to match a property from 2020 to 2022, we use its 2020 value instead and inflate it to 2022 prices using the DLD's residential sale price index.¹⁴

We report values in US dollars; the United Arab Emirates dirham has been pegged to the same US dollar value since November 1997 (1 USD = 3.6725 AED).

¹²Only ownership by Gulf Cooperation Council (GCC) nationals (UAE, Saudi Arabia, Qatar, Kuwait, Bahrain, Oman) is possible in these areas. To distinguish between Emirate ownership and that of other GCC countries, we use comprehensive data on rental contracts, also provided to us by journalists, which allow us to observe what share of landlords are Emirate versus other GCC countries in these areas.

¹³This dataset was also provided to us by journalists. While we are unable to go into more detail as to its origin, by comparing it to less comprehensive transactional data published by the Dubai Land Department, we believe it to be comprehensive.

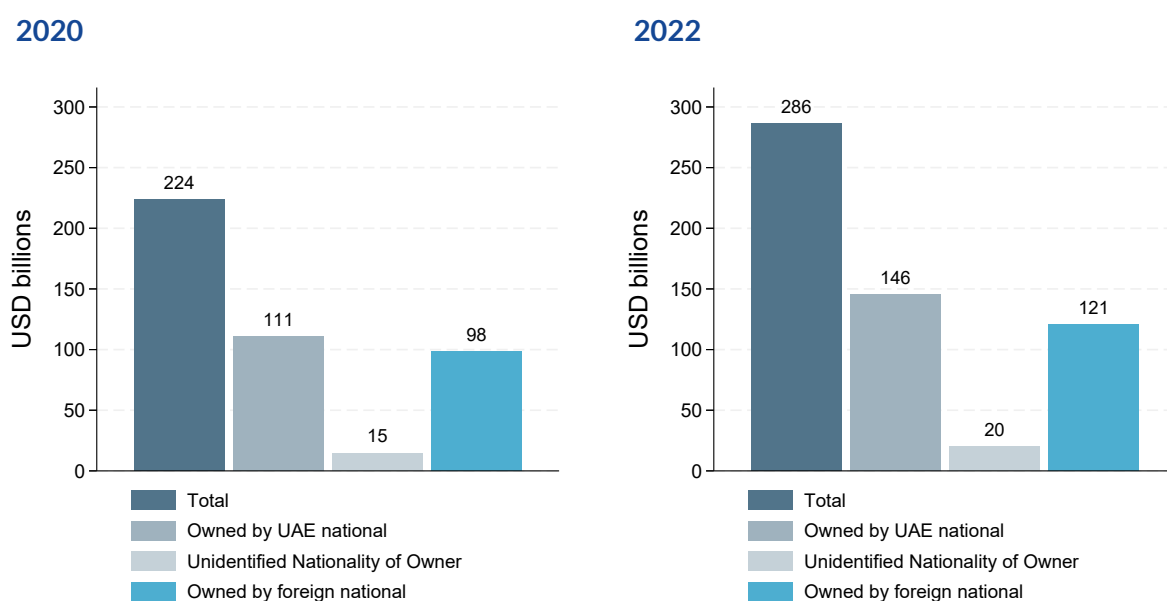
¹⁴In [Alstadsæter et al. \(2022\)](#), we used the average square meter price for residential properties sold between January 2018 to November 2020 to calculate the early 2020 values. Also then, we excluded the top and bottom 5 percent of the square meter prices from the calculation.

4 Offshore Ownership in Dubai: 2020 and 2022

This section presents the most up-to-date estimate of ownership of residential real estate in Dubai. As noted above, we focus only on residential real estate, in contrast to prior estimates presented in [Alstad-sæter et al. \(2022\)](#) and the first version of the [Atlas of the Offshore World](#). We should also emphasize that, following the procedures detailed above, these estimates here are for the entire city of Dubai, not just the properties uncovered in Sandcastles 2020/2022.

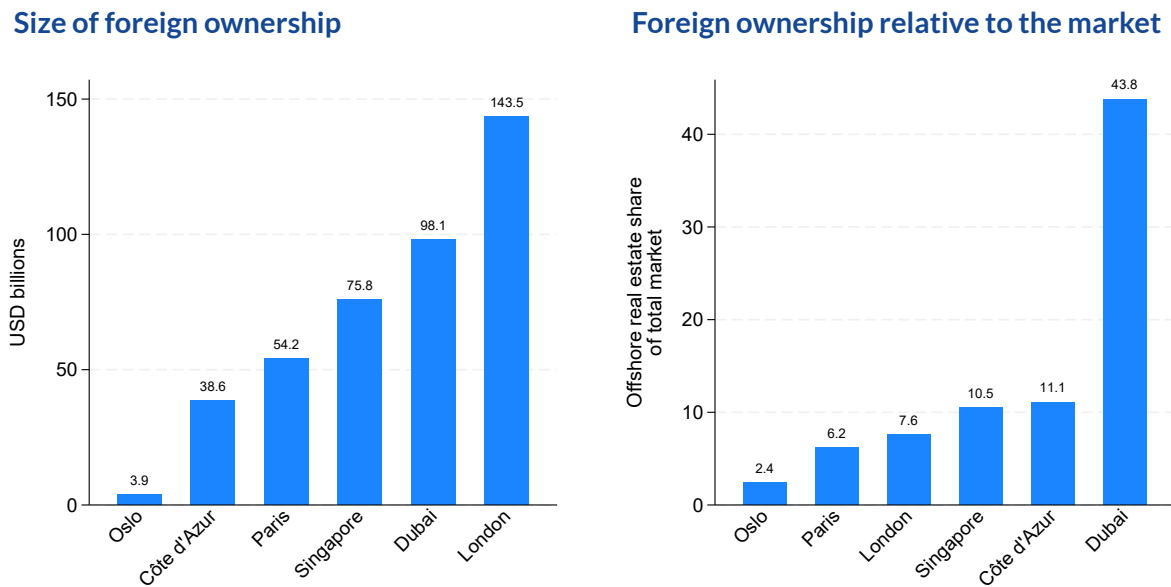
FIGURE 3

Value of Existing Residential in Dubai



Notes: This figures shows our estimate of the value of residential real estate in Dubai, first in aggregate, then broken down into three categories: Real estate owned by local nationals, real estate owned by companies or firms where we are uncertain about the ultimate owners' nationality and real estate owned by foreign nationals. All values are reported in nominal USD billions (1 AED is pegged to 0.272 USD).

Offshore share: We estimate that foreigners owned real estate worth USD 121 billion in early-to-mid 2022, more than 40 percent of the total residential real estate stock at that time, as seen from figure 3. Foreign-owned residential real estate wealth grew by almost 25 percent in nominal terms, around USD 23 billion, between early 2020 and 2022. However, we find that the total foreign-owned share remained stable between the two years. This may reflect either the saturation of the market, but also the fact that our estimates are likely to have missed a significant amount of the real estate boom that occurred between 2021-2023, which may have increased the foreign share substantially. Furthermore, the recent adjustments to the residency-by-investment program may generate even more interest in the property market by foreigners. Regardless, the foreign ownership share in Dubai residential real estate is exceptionally high, also in an international context.

FIGURE 4**Residential Real Estate in Dubai Compared to Rest of the World (2019/2020)**

Notes: This figure compares the estimate of foreign-owned residential real estate in Dubai with five other cities and areas around the world. All numbers are for residential real estate only, with the exception of London. The methodology behind the estimates is documented in [Alstadsæter et al. \(2023\)](#), and the London estimates in more detail in [Bomare and Le Guern Herry \(2022\)](#). The country-by-country estimates from the different cities are shown and can be downloaded from [Atlas of the Offshore World](#).

International comparison: Due to the proliferation of automatic exchange of information agreements – agreements between countries concerning the exchange of information about their citizen’s financial assets in bank accounts around the world – it is becoming increasingly hard to use bank accounts in traditional financial centres like Switzerland to store wealth without one’s tax authority learning about it. A growing evidence base now points to the significant effect these policies had on the investment decisions of wealth-holding individuals.¹⁵ An attractive alternative for tax evaders and others with illicit motivations is to invest in real estate, which is not covered by the two major automatic exchange of information agreements (FATCA and the Common Reporting Standard). As offshore real estate has the potential to now mimic the traditional role of the Swiss bank account, it is important to understand both the location and magnitude of this foreign ownership across the world. There are also several studies now showing how tax compliance among owners of offshore real estate is lower, and that a substantial share of this investment is also tax motivated.¹⁶

Figure 4 illustrates how Dubai, when compared with other major cities and areas, is an important destination for foreign investment in real estate. Only the estimates for London by [Bomare and Le Guern Herry \(2022\)](#) exceed the foreign holdings in Dubai in pure dollar terms (their estimate also includes commer-

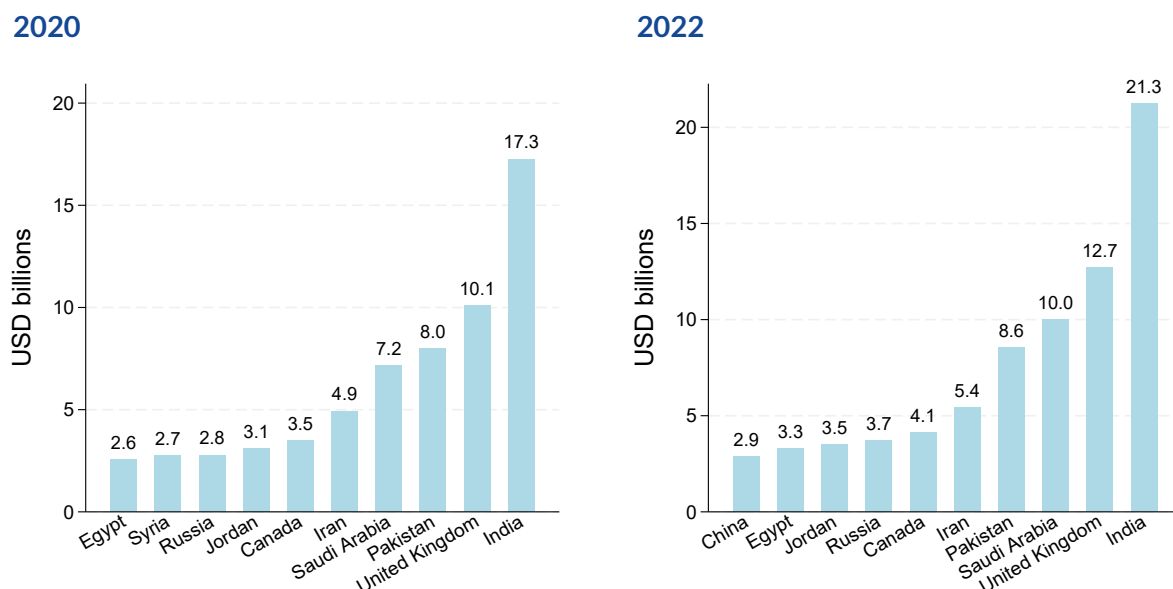
¹⁵See for instance [Beer et al. \(2019\)](#), [O’Reilly et al. \(2021\)](#), [Menkhoff and Miethe \(2019\)](#), [Casi et al. \(2020\)](#), [Alstadsæter et al. \(2023\)](#), [Alstadsæter et al. \(2024\)](#).

¹⁶Estimates in [Alstadsæter et al. \(2022\)](#) shows how less than 30 percent of properties in Dubai that was supposed to be reported to Norwegian authorities for tax purposes was reported in 2019. See also [Bomare and Le Guern Herry \(2022\)](#), [Johannesen et al. \(2022\)](#).

cial real estate, where ours does not) when we compare Dubai to the other cities and areas in the [Atlas of the Offshore World](#). The importance of foreign capital in the Dubai real estate market becomes even more evident when we compare the offshore share in the six different real estate markets. With 44 percent, Dubai is far above the other cities, which have an offshore share between 2 and 11 percent. The next two locations are Côte d’Azur and Singapore, with around 11 percent foreign ownership. This is still relatively high in an international context, as long as Dubai is disregarded. The offshore share in London and Paris, two global mega-cities, are a bit lower, at 8 and 6 percent. The last city for which we have recent estimates, Oslo, has a foreign share of 2 percent, markedly lower than in London and Paris. It illustrates that foreign ownership of real estate, also in a relative sense, is less important in smaller and less global cities.¹⁷

FIGURE 5

Value of Existing Residential in Dubai in 2020 and 2022: Top 10 Countries



Notes: This figure presents our estimates of the value of the residential foreign-owned real estate in Dubai in 2020 and 2022 by the country of the owner. It shows the top 10 countries (other than the United Arab Emirates). Values are reported in USD billions (1 AED is pegged to 0.272 USD). The methodology behind the estimates of the property values and apportionment to countries are outlined in section 3. Results for all countries are shown in appendix section C.

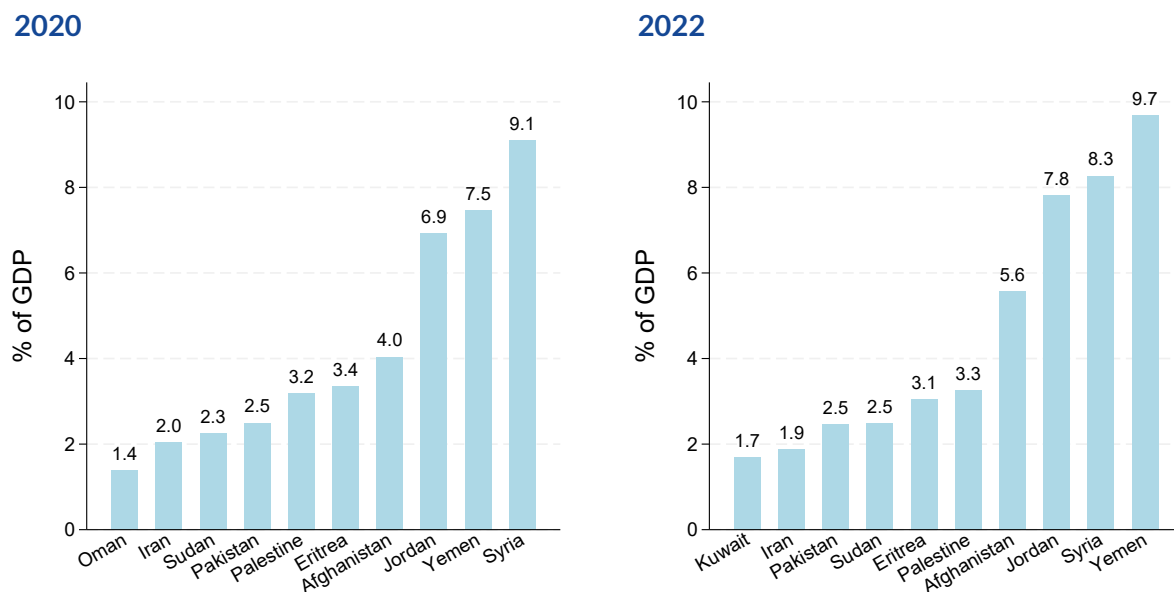
Total values: Figure 5 shows the total wealth each country has invested in Dubai residential real estate in 2020 and 2022. The top countries are India, the UK, Pakistan, Saudi Arabia and Iran. This is the same pattern as [Alstadsæter et al. \(2022\)](#) showed for 2020, which also included commercial real estate, land and off-plan properties in the sample. They are all countries with notable historic, cultural, or economic ties to Dubai and the United Arab Emirates. Together, these five countries own almost half of all offshore residential real estate in Dubai, a pattern which is consistent across 2020 and 2022. The value of foreign-owned real estate in general grew by almost 25 percent between 2020 and 2022. The figure

¹⁷This may be specific for residential real estate. The foreign share in the commercial real estate market in Norway is far larger, at around 10 percent [Alstadsæter and Økland \(2022\)](#).

shows that Saudi Arabia outgrew this pace, with ownership increasing by around 40 percent, from USD 7.2 billion to USD 10.0 billion, while Pakistani ownership stalled, growing by less than 10 percent. This also means that Saudi Arabian ownership now is more important than Pakistani ownership in Dubai. Nationals from large countries like Canada, Russia (read more in section 5) and China also have considerable wealth invested in the Dubai residential real estate market, while the United States (USD 2.6 billion in 2022) are notably absent from the top 10.

FIGURE 6

Value of Existing Residential in Dubai relative to GDP: Top 10 Countries



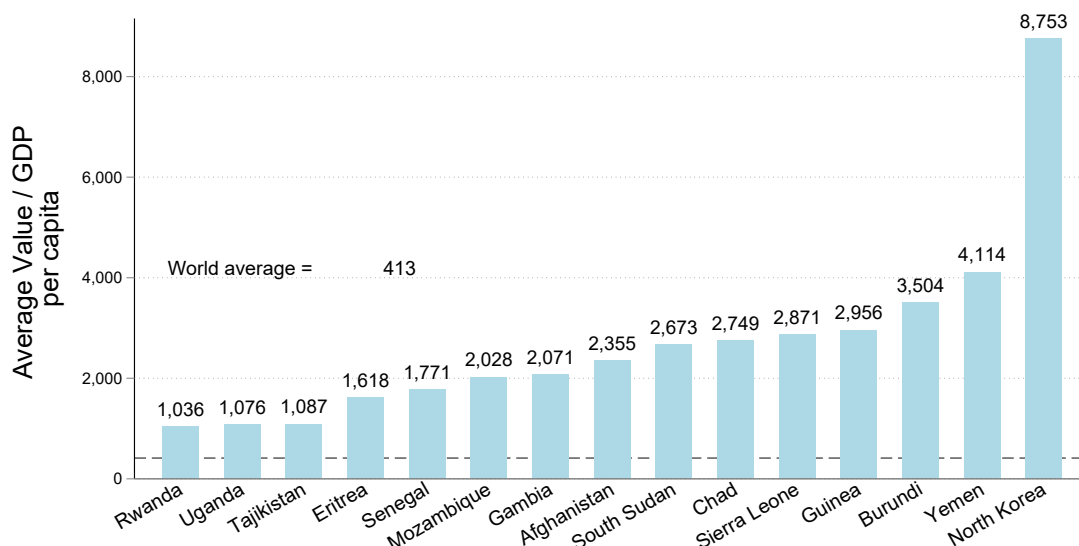
Notes: This figure shows the value of the residential foreign-owned real estate in Dubai in 2020 and 2022 by the country of the owner compared to GDP in the home country. It shows the top 10 countries (other than the United Arab Emirates, tax havens and citizenship-by-investment countries, see lists in [Alstadsæter et al. \(2022\)](#)). The GDP numbers are for 2019 and 2021, as the estimates of real estate ownership is from the first half of the respective years. The GDP series used is custom and developed by this method: we choose the one that has the best 2000-2022 coverage from 5 potential sources (UN, IMF's WEO, WB, External Wealth of Nations, and WID). We then use the list in that order of preference to choose between ties.

Values scaled by GDP: The list of top countries in terms of value is dominated by large countries. Figure 6 shows how the top list changes when the wealth held by foreign owners is scaled by the total income in the home country. This measure unveils the countries that are over-represented relative to the purchasing power of their citizens. The top five countries by this measure, Yemen, Syria, Jordan and Afghanistan, hold residential real estate worth between 5 and 10 percent of one's country's GDP in 2022. These countries, ridden by corruption and conflict, also topped the list in 2020.

All five countries saw their wealth in Dubai increase faster than their GDP in this period. This is partly due to their inclination to invest in Dubai, but also because of the unstable conditions at home. The largest increase when scaled by GDP is evident for Afghanistan, for instance. This is partly driven by an increase in residential real estate wealth in nominal terms, but also by the fact that Afghanistan's GDP has fallen by more than 10 percent between 2019 and 2021 following the last year's unrest.

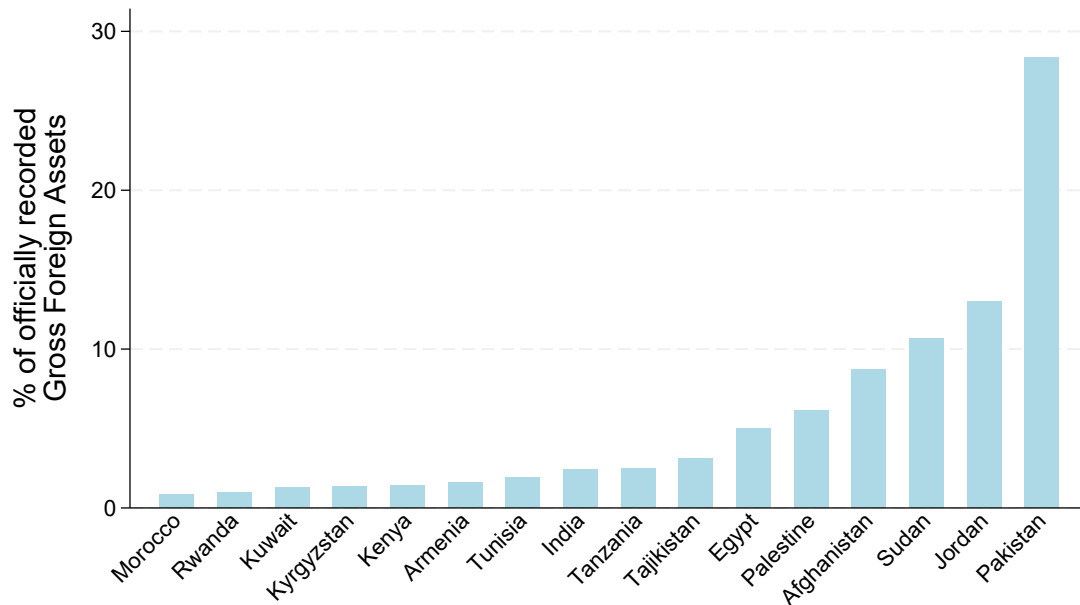
Notably, the conflict and corruption ridden countries are all surpassed by Saint Kitts and Nevis, a small island jurisdiction with a very popular citizenship-for-investment program (reportedly favoured by Russians). Saint Kitts and Nevis nationals own residential real estate worth USD 843 million in 2022, which is equivalent to 98 percent of Saint Kitts and Nevis' GDP (not shown in the figure).

FIGURE 7
Average Value of Existing Residential in Dubai Compared to Mean Income (2022)



Notes: This figure shows the average value of the residential real estate held by each owner from different countries compared to the GDP per capita in the home country. A value of 1,000 means that the owners from a country on average holds real estate in Dubai which amounts to 1,000 times the GDP per capita in that country. The GDP series used is custom and developed by this method: we choose the one that has the best 2000-2022 coverage from 5 potential sources (UN, IMF's WEO, WB, External Wealth of Nations, and WID). We then use the list in that order of preference to choose between ties. The population series is from the World Bank.

Average value relative to GDP per capita: There is not necessarily a complete overlap between countries with a lot of wealth in Dubai real estate compared to GDP and countries where the national elite has an inclination to invest in Dubai real estate. The average value of residential real estate portfolios in Dubai relative to GDP per capita in the home country lets us measure this more effectively. This measure compares the average value of the real estate portfolios of owners from each country to the average income in the same country. Figure 7 shows that there are some overlap between the top countries in terms of this measure and in terms of GDP, notably Yemen and Afghanistan. These two countries have several hundred owners of Dubai residential real estate, who on average own Dubai residential real estate worth several thousand times the average annual income in those countries. But there is also other countries that do not have a lot of investors in Dubai, but for which there is significant residential real estate wealth in the hands of those investors who have. These are typically lower-income African countries like Burundi, Sierra Leone, South Sudan, Gambia, Mozambique, and Senegal.

FIGURE 8**Value of Existing Residential Real Estate in Dubai as % of Recorded Gross Foreign Assets (2022)**

Notes: This figure compares the real estate assets in Dubai to other foreign ownership statistics. It shows the value of Dubai real estate compared to the officially recorded gross foreign assets (excluding monetary gold), as recorded in the [International Investment Position database](#) published by the IMF. We compare the early 2022 residential real estate wealth to the 2021 IIP statistics, with the exception of Afghanistan, where the 2020 data is the last available.

Gross Foreign Assets: The International Monetary Fund (IMF) surveys and maps the assets and liabilities of countries and their residents in the International Investment Position statistics. The Gross Foreign Assets is a subset of this statistic that measures the value of financial assets held abroad by the residents of each country, in other words, the countries' gross wealth abroad. This is an important macroeconomic indicator, but it does not cover directly held real estate. Figure 8 compares the wealth in residential real estate in Dubai to the Gross Foreign Assets, as they are recorded in the database published by the IMF. The inclusion of Dubai residential real estate in this statistic is in general non-important, but with some major exceptions: Pakistan, Jordan, Sudan, Afghanistan, Palestine and Egypt. It is especially important for Pakistan, for which the inclusion of Dubai real estate would increase the recorded foreign wealth of the country by almost 30 percent.

5 Trends in Russian Investments 2020-2024

Following the Russian invasion of Ukraine, a multitude of media and industry reports indicated that Russian investment in Dubai property **had skyrocketed**. Just six months after the war, a local property consultancy announced that **one in five** requests for property information came from Russian nationals. The Dubai-based real estate company Betterhomes reported that in 2022 Russians topped all other nationalities for the number of real estate purchases during the year (a 230% **increase** on the previous year), falling only to third place in 2023. There were even reports that infamous Russian oligarch Roman Abramovich was **spotted** last year real estate shopping around the city.

There are several reasons the war led to an increase in Russian investment in the Dubai property market. First, sanctions imposed by the US, UK and Europe shut off Western property markets from most of the country's oligarch class. Second, both the war and the imposition of sanctions raised the perceived risks of dealing with wealthy Russians more generally, leading to a chilling effect in other markets (Collin et al., 2023). Finally, political turmoil following the invasion, including the eventual conscription of men of military age, led many Russians to flee their country to seek housing elsewhere.¹⁸ As it has shown little interest in imposing direct sanctions,¹⁹ the UAE has remained particularly welcoming to Russians looking to move their wealth, their business or their homes to a safer haven.

Recent data from the housing market makes it clear that the Russian presence really has surged since the invasion. Using public data published by Dubai's Electricity and Water Authority (DEWA) on new residential water and electricity connections around the city, we estimate that by mid-2022, Russians were obtaining connections at over six times the rate observed just before the war (Figure 9). We see a similar, if more limited explosion when we look at the number of Russian tenants signing new rental contracts.²⁰

What is less clear is how much Russian money has flowed into the Dubai real estate market after the invasion. Above, in Table 5, we reported that net Russian ownership of on-plan and off-plan Dubai property increased by approximately \$900m and \$1.4b respectively between the beginnings of 2020 and 2022. But this likely underestimates the true extent of Russian purchases after the war, as the second source of data provided by C4ADS only covers the beginning of 2022, and it was not until the summer of 2022 that the Russian ruble had stabilized and interest began to spike.

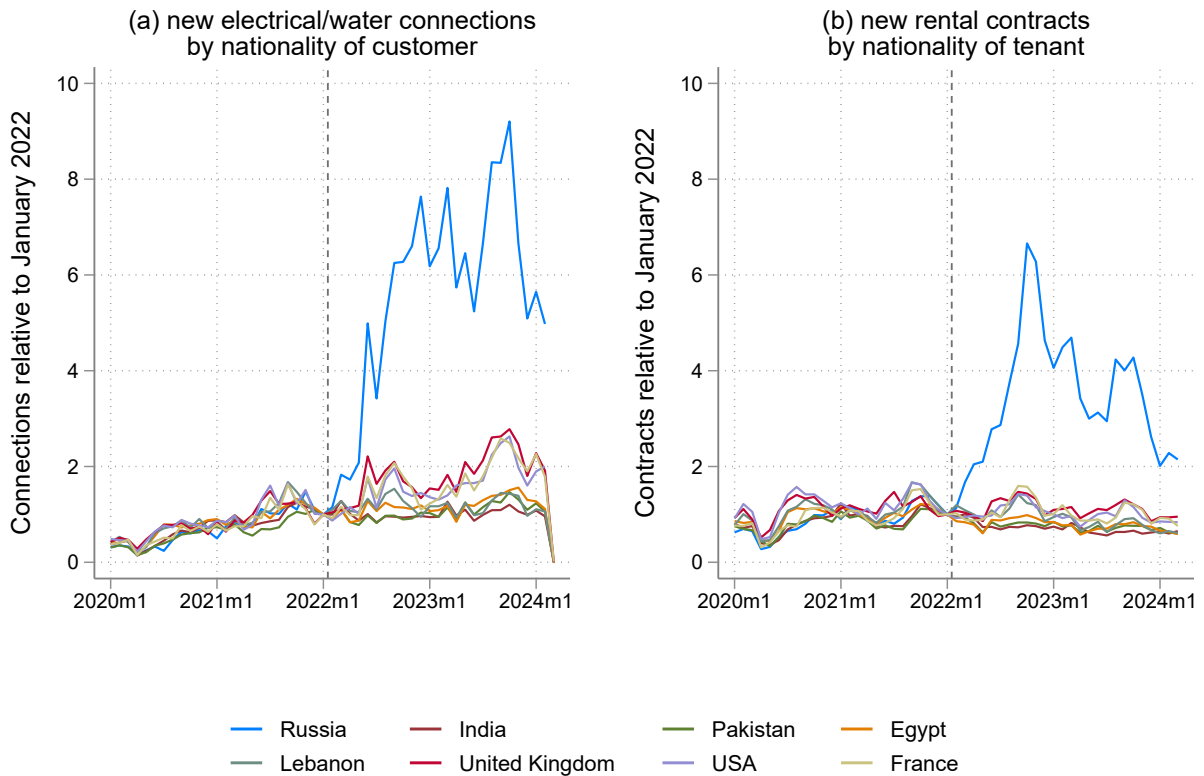
However, what we do have is clear evidence that Russians often choose to buy in the same location where they sign up for utility bills or rental agreements. When we examined the relationship between neighbourhoods in Dubai where Russian bought properties in the interim period between the two leaks and where they signed DEWA or tenancy agreements, we found the two were very closely related (Figure 10). There is also evidence from industry reports that Russian expats living in Dubai **are significantly more likely to purchase a property than other expats**.

To estimate how much Russian money flowed into the Dubai property market following the invasion, we

¹⁸Migration consultancy Henley and Partners **estimated** that approximately 8,500 Russian millionaires left the country in 2022.

¹⁹Emirate banks may still conduct sanctions screening so as not to fall afoul of US regulators, who can still exert pressure on the UAE financial system through its control of dollar clearing.

²⁰This data was also provided to us in confidence by journalists, but we have good reason to believe it is comprehensive.

FIGURE 9**Russians signed up for more utility and rental contracts in Dubai following the invasion**

Notes: Figure (a) shows new monthly electricity and water (DEWA) connections for residential properties in Dubai, by nationality of customer. Figure (b) shows new rental contracts, by listed nationality of the tenant. Both outcomes are relative to their value in January 2022. We list eight of the most popular nationalities in the city. Cypriots are re-coded as Russians.

rely on a simple assumption: that Russians’ share of the value of purchases of residential properties in a given neighbourhood in the city at any given point in time is directly proportional to their share of the value of new rental contracts signed in that period,²¹ and that this relationship holds throughout time. if Russians signed 5% of the total value of rental contracts in Palm Jumeirah, and \$10m of property was sold there in a given month, we allocate \$2m of that value to Russian buyers. This assumption would fail if, for example, the Ukraine invasion led a lot of Russians to move to the city to rent but did not lead to a commensurate increase in the value of properties they bought or on the other hand if Russian capital more easily flowed into the city than actual citizens. For these reasons, we treat these estimates as preliminary and tenuous.

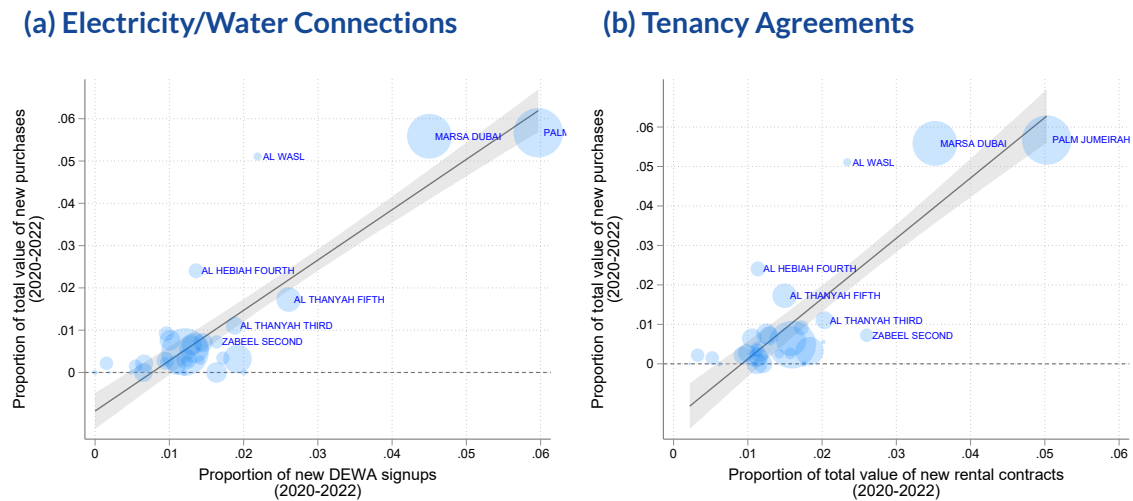
We also make one further assumption: as Emirates are likely to be under-represented in both the utility and tenant data (they are much more likely to own their own home or to be a landlord than a tenant), we assume that Emirates capture *at least* the same share of new sales in a neighbourhood as the share of all property in that neighbourhood they held in 2020.²²

²¹We use the value of rental contracts rather than the number of new contracts because we believe the value to better capture preferences for higher-value properties.

²²We use the maximum of four possible shares: the Emirate share of the value of the stock of all residential properties in each neighbourhood in 2020, the Emirate share of all identifiable landlords that had an active lease in the neighbourhood in

FIGURE 10

Between 2020 and 2022, Russians invested in the areas that also saw more Russian sign-ups for utilities and rental contracts

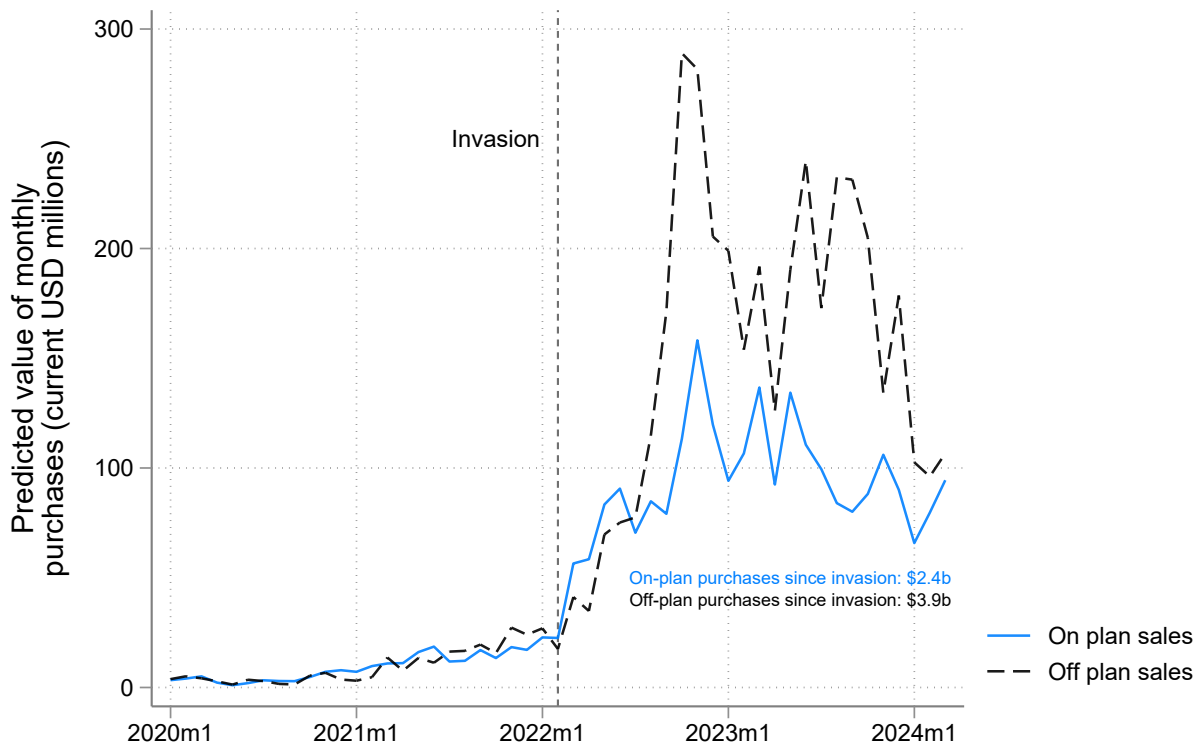


Notes: This figure shows, for neighbourhoods with more than 500 residential properties, the proportion of the value of (a) new DEWA contracts signed by Russians (as a proportion of contracts with an identifiable nationality) and (b) all new rental contracts signed by Russian tenants (as a proportion of contracts with an identifiable nationality) between the start of 2020 and the start of 2022 graphed against the proportion of all new property purchases made by Russians in areas covered in both the 2020 and 2022 editions of the leak. Both scatter points and the local polynomial fit are weighted by the size of total investment between 2020-2022.

As a result of this exercise, we attribute \$2.4 billion worth of on plans sales of residential properties to Russian buyers over the two years following the invasion, and a further \$3.9 billion in the off-plan market, approximately 5-6% of the total market. This is roughly a 940% and 1,500% increase in the value of sales for the previous two years. Our overall estimates differ very little if we use the proportion of DEWA signups instead of rental agreements. We should emphasize that off-plan purchases do not necessarily mean the same value has changed hands: an off-plan purchase may involve a down payment of 10-20% of the actual value. We should also note that these are estimates of new purchases, gross Russian inflows into real estate, not 'net' estimates of the total change in Russian-held stock (there are already some [reports](#) that many Russians have begun to sell the properties they bought during the frenzy of activity following the invasion).

There are a few reasons why we expect these numbers to be conservative. The first is that our allocation mechanism underestimates actual Russian inflows over the 2020-2022 period: indicating that only \$230-250m worth of on-plan properties were bought by Russian investors, where data from Sandcastles suggests that at least \$450m was bought over this period. Also, when we compare our estimates to industry reports, they come in smaller, but in the same order of magnitude. In their [2022 Residential Market Review](#), Betterhomes reported (i) Russians, (ii) British and (iii) Indians as being the top non-resident investors in Dubai real estate, with India and Russia swapping places for the resident investors ranking. By contrast, our ranking is (i) British, (ii) Russia and (iii) India. All three countries are also both our and Betterhomes' top three rankings for 2023. Finally, a recent [analyst report](#) by CI Capital esti-

2020, or the Emirate share of tenants who signed new rental contracts (or DEWA contracts, for our alternative estimate) in that neighbourhood in the month in question.

FIGURE 11**Estimated Value of Gross Russian Inflows Following the Invasion**

Notes: The figure shows our estimate of the dollar amount of residential property (villas, apartments, hotel rooms and hotel apartments) purchased by Russian nationals in the period following the invasion of Ukraine, on the assumption that the share of monthly new purchases in a given neighbourhood is directly proportional to the share of new rental contracts (out of contracts with an identified nationality) signed by Russian tenants in the same neighbourhood and month. The blue line indicates our estimate for on-plan properties (those that are already built) and the black line indicates our estimate for off-plan properties (those that have been sold, but have yet to be finished by the developer). These estimates are gross - they do not account for Russian sales of properties. Our source of data on sales is Dubai Pulse’s [public record of property transactions](#).

ated that 12% buyers in developments by Emaar Properties were Russian in the first three quarters of 2023. Our estimates for the same time period are 8%, another indication that our numbers are slightly conservative.

6 Conclusion and policy implications

Even though Dubai’s real estate market is booming, it remains a black box to rest of the world, particularly those that are concerned with the city’s role in enabling transnational corruption, tax evasion, smuggling and other illicit financial flows. As stated in the introduction, the goal of this note was to open this black box, which we do by combining several confidential data sources, including information on the nationality of owners, with public data published by the Dubai government. We estimate the total size of Dubai’s residential property sector in 2020 and 2022 to be substantial, between 224-286 billion USD. Thanks to a range of policies devised to incentivize foreign ownership, Dubai has one of the

highest rates of foreign ownership in the world: approximately 43% of the value of all residential property is held by foreign nationals. While countries with long-standing relationships with Dubai (including India, Pakistan, the UK and Saudi Arabia) have the most substantial holdings, there are also significant holdings from nationals from countries currently or recently under sanctions, or from low-income countries with significant problems with corruption. Finally, we provide new estimates on the potential scale of new real estate investments made by Russians following that country's invasion of Ukraine: around \$2.4b in new on-plan investment, and a further \$3.9b in off-plan investment. As stated above, these are tentative and subject to simple, but defensible assumptions. These findings highlight that the scale of Russian investment in Dubai's markets not only soared following the Ukrainian invasion, but remained undeterred by ostensible efforts Dubai has made to improve its anti-money laundering (AML) policies following its greylisting by the Financial Action Task Force.

Taken together, these results have several implications for international efforts to crack down on cross-border tax evasion and money laundering.

First, the sheer scale of foreign investments in the Dubai property market represents a major blind spot for foreign tax authorities. Cross-border tax evasion has gotten significantly harder over the last decade as tax authorities began to gather information on foreign assets through automatic exchange-of-information (AEOI) (Casi et al., 2020). However, the sheer openness of the Dubai market allows foreigners ample opportunities to circumvent this effort. For one, its residency-by-investment scheme has [in the past](#) allowed foreigners to hide their actual tax residency, something which is still possible to do even after a recent [tightening of regulations](#). Second, while the UAE engages in the exchange of information of *financial* account information with other countries, the underlying agreements do not cover physical property. We have shown in the past that in countries such as Norway, where taxpayers are required to report on their worldwide assets, those who held property in Dubai often choose not to do so. By our estimates, in 2022 about 70% of foreign-held real estate is owned by citizens of countries that participate in the CRS.²³ Without regular reporting on these assets, foreign tax authorities will be unaware of instances where tax-evading wealth has been shifted to Dubai to escape reporting, and may even be unaware of instances where that wealth is generating substantial rental income, often consumed before it can be reported on.

Second, the size and growth of foreign investment in Dubai's property market represent a significant money laundering vulnerability, calling into question the UAE government's ability to ensure that its real estate sector is free of dirty money. The sheer size of the market makes it particularly attractive for those looking to laundering the proceeds of corruption and crime, something that has been demonstrated in [previous reporting](#) on the Sandcastles data. Despite the enormous demonstrated risks and vulnerabilities of the sector, there appears to be little-to-no *effective* regulation of real estate agents. [Earlier assessments](#) by the FATF have highlighted that those working in the real estate sector are rarely compliant with their obligations to file suspicious transaction reports (STRs). According to UAE's Financial Intelligence Unit, between July 2020 and June of 2023, [only 405 STRs were filed by real estate](#)

²³Furthermore, foreigners hold ownership rights on a substantial amount of off-plan property. Funds invested in off-plan (yet to be built) properties are held in escrow accounts, which are not typically reportable accounts under the OECD's Common Reporting Standard.

agents, over a period where over 300,000 property transactions took place.²⁴ With a STR reporting rate of just over 0.1%, it is highly unlikely that the UAE authorities are receiving useful information about the use and abuse of the real estate sector by illicit actors.

Based on our results, we have three main policy recommendations:

Recommendation 1: renewed international pressure on the UAE to clean up its real estate sector

Despite the UAE's continued role in facilitating illicit activity, international pressure on the jurisdiction to clean up its markets has been muted at best. While the FATF added the UAE to its anti-money laundering greylist in 2022, it was removed in February of 2024 after the UAE committed to establishing new executive offices and courts to combat money laundering, as well as new guidelines for banks and non-bank entities like real estate agents.

Given the sheer size and scale of foreign investment in its real estate sector and the considerable increase in Russian investment following the Ukrainian invasion, we find it highly unlikely that the UAE has made significant progress in fighting money laundering in its real estate sector, despite its de-listing by the FATF. There is a serious disconnect between 'paper' compliance with anti-money laundering regulations, where jurisdictions like the UAE pass the appropriate laws or create institutions dedicated to tackling the issue, and 'effective' compliance with those regulations, which would entail deterring or catching illicit actors as well as prosecuting money laundering cases on a scale commensurate with the growth of the sector.

While the EU has chosen to keep the UAE on its own anti-money laundering blacklist and should continue doing so, it should be joined in its effort to pressure the UAE government by other powerful entities such as the FATF or the US and UK governments. Without renewed international pressure, the UAE is unlikely to make a serious effort to clean up its real estate sector.

Recommendation 2: the expansion of automatic-exchange-of-information reporting to real estate

Automatic exchange-of-information agreements such as FATCA and the CRS have an Achilles's heel: as has now been demonstrated across multiple studies, offshore real estate represents a significant escape route for the wealthy looking to hide their wealth from the prying eyes of tax authorities. While recently some jurisdictions, such as the UK, have made an effort to make ultimate ownership of their real estate more transparent, most have not. A logical next step would be to upgrade the multilateral frameworks that govern much reporting of foreign financial assets - namely the OECD's Common Reporting Standard - to extend them to real estate assets. Some jurisdictions may struggle with this, as land registries are not always maintained by a central government authority. But most should be able to do so if they are in compliance with FATF recommendations concerning real estate, which at present recommend that the real estate industry to gather much of the same information on their clients that banks are required to. From our analysis of data from the Dubai market, it is clear that the UAE authorities have extensive information on property ownership by foreigners and so would have the full ability to comply with an enhanced AEOI regime.

²⁴Authors' calculations from DLD transaction data.

Recommendation 3: a move towards a global asset registry

Finally, authorities looking to enforce tax compliance and fight financial crime require information on a large class of entities and their ownership. At present, that information exists but remains fragmented in private companies, banks, national beneficial ownership registries (incomplete), central securities depositories, financial authorities, land registries, etc. The dispersion of information across different institutions makes it impossible at this stage to have a comprehensive view of wealth and its ownership. In turn, this limits the quality of public statistics on inequality and taxation and continues to facilitate tax avoidance, evasion, and money laundering.

As detailed in the Global Tax Evasion Report 2024 ([Alstadsæter et al., 2023](#)), the creation of a unified asset registry could address this issue. Centralization of data would help link information across registers for different types of assets. Building on automatic exchange of information standards, data could be centralized first at a regional level (e.g., for Europe at the level of the European Union) and then at a global level. Information could be cross-checked by specialized personnel tasked with gathering and linking wealth information across all asset types. The ultimate objective of the registry would be to record the ownership of both non-financial and financial assets.

A registry combining information from all available national and international sources would allow substantial progress not only in the fight against tax evasion, but also in the fight against money laundering and the financing of terrorism, in the monitoring of financial stability, and more broadly in the regulation of inequality and globalization.

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A Data Coverage.

When utilizing leaked data, there is always a challenge to corroborate the credibility of the data, both for the researchers utilizing them and for the readers. In our case, corroborations have been conducted on three different levels, leaving us confident in both the accuracy of the individual observations and in the total coverage of the data:

1. C4ADS. The organization has over several years worked extensively on mapping and analyzing the Dubai property market, with a focus on case studies identifying properties owned by sanctioned individuals. Their landmark Sandcastles report was published in 2018, and in collaboration with the Carnegie Endowment a 2020 report examined Dubai's Role in Facilitating Corruption and Global Illicit Financial Flows.²⁵²⁶ Over the last years, C4ADS have extended the original data used in the Sandcastles report to an extensive Dubai Property Database covering 833,000 property ownership records, at the same time corroborating the accuracy of the information. On their website, they state that "C4ADS assesses this data to be credible, with the caveat that it does not constitute evidence of the same quality and standard as a property deed, a form of official documentation strictly controlled in the UAE as confidential information. The mention of any individual, company, organization, or entity in this dataset does not imply the violation of any law or international agreement."²⁷

2. Investigative journalists. C4ADS has shared their Dubai Property data, both the original Sandcastles data and the extended Dubai Property Database, with numerous investigative journalists and media outlets, who separately have published stories based on the property and owner information in the leak. The Organized Crime & Corruption Reporting Project (OCCRP), a reporting platform for a global network of independent media centres and journalists, coordinated a series of stories on illicit finance and ownership of Dubai properties in their Golden Sands project in 2018.²⁸ The updated Dubai Property database – the data used in this project – is the basis for stories on ownership of Dubai real estate in the New York Times and for the stories published under the tagline "Dubai Uncovered". The "Dubai Uncovered" revelations were a result of the work by a consortium of investigative journalists from around the world, headed by the Norwegian financial newspaper E24 and including Le Monde, Süddeutsche Zeitung, De Tijd, OCCRP and more than 20 other media outlets.²⁹ These investigations provide important confirmation of the accuracy of the database. The journalists investigated and corroborated several hundred owner-property-links, through their own detailed research and in some cases also through gaining outright confirmation of the accuracy of the data from the owners of properties.

3. The research group. At the outset of the work conducted for this note, the research team underwent the ambitious task of matching the Sandcastles dataset to publicly-provided data published by the

²⁵<https://C4ADS.org/reports/sandcastles/>

²⁶<https://C4ADS.org/reports/dubai-corruption-and-global-illicit-financial-flows/>

²⁷<https://C4ADS.org/multimedia/the-C4ADS-dubai-property-database/#disclaimer>

²⁸<https://www.occrp.org/en/goldensands/>

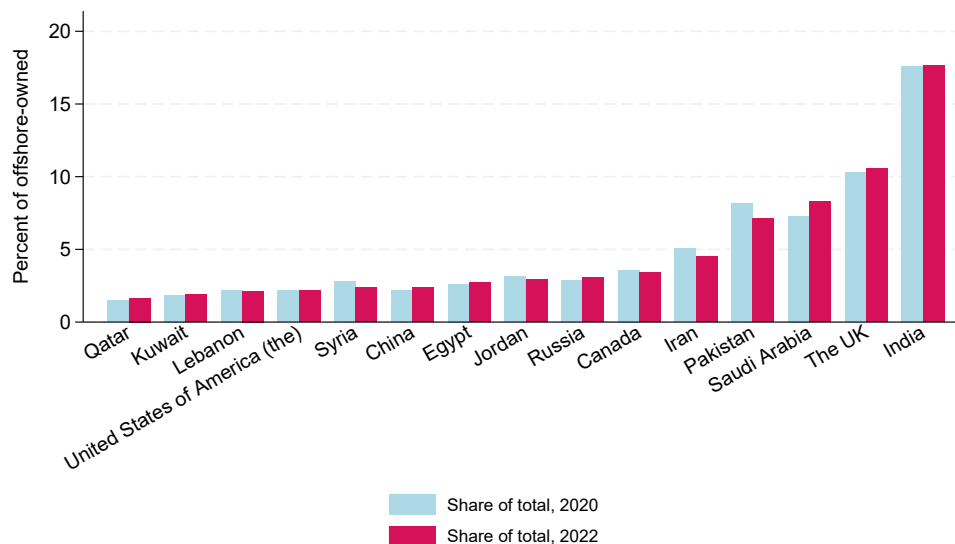
²⁹For overview of media coverage, see: <https://C4ADS.org/multimedia/the-C4ADS-dubai-property-database/#publications>

Dubai Land Department on the Dubai Pulse Platform. This helped the team verify many attributes of the properties in Sandcastles, including their size, location, and status (on-plan, off-plan, cancelled) and type. Also, using both transaction data published by the DLD as well as transaction data provided to the team by journalists, the team was able to confirm the sale price of a large share of properties.

B Changes in country distribution between 2020 vs. 2022

FIGURE A1

Share of Offshore-owned Existing Residential in Dubai (2020 and 2022)



Notes: This figure presents the ownership of residential real estate in Dubai in 2020 and 2020 by the country of the owner. The ownership is shown as a share of the total foreign ownership, meaning that a stable percentage share imply growth in the value of the nominal ownership. The rise in the value of the total foreign ownership is shown in figure 3 and the nominal USD values for individual countries are shown in figure 5 and appendix section C.

Figure A1 takes our country-by-country estimates in 2020 and 2022 and compares the relative importance of each country to the total foreign ownership. It shows that the investment patterns are strikingly similar across this two-year period, when we look at how the aggregate holdings have changed. We read this as a statement of how severe and lasting the investment in residential real estate in Dubai is, and that it will take time for new trends to induce significant changes in the relative importance of different countries. It is also likely driven by the fact that the more recent surge in property investment happened after the 2022 data was obtained.

C Detailed Country-by-Country Results

Table: Detailed Country-by-Country Main Results I

Country	Number of properties Leaks, 2020	Number of properties Leaks, 2022	Number of owners Leaks, 2020	Number of owners Leaks, 2022	Aggregate Value Leaks, 2020 USD mill.	Aggregate Value Leaks, 2022 USD mill.	Number of owners City-wide, 2020	Number of owners City-wide, 2022	Aggregate Value City-wide, 2020 USD mill.	Aggregate Value City-wide, 2022 USD mill.
Afghanistan	1,655	1,791	880	833	638.6	801.2	955	915	747.9	913.4
Albania	7	16	13	15	3.4	9.8	13	16	3.4	12.0
Algeria	848	877	595	544	281.5	328.0	641	651	324.8	426.7
American Samoa	<5	<5	<5	<5	1.3	1.4	<5	<5	1.3	1.5
Andorra	<5	<5	<5	<5	0.1	0.1	<5	<5	0.1	0.2
Angola	59	74	30	30	22.6	28.9	31	47	24.5	61.2
Anguilla		<5		<5		0.3			0.1	0.3
Antigua and Barbuda	21	46	11	15	13.6	26.2	14	15	21.0	32.4
Argentina	169	141	80	77	48.7	50.1	83	91	52.4	66.6
Armenia	185	174	154	152	72.9	83.6	176	177	93.4	110.0
Aruba									0.1	0.0
Australia	1,446	1,497	1,441	1,365	709.6	785.2	1,599	1,656	865.1	1,076.6
Austria	366	398	297	292	226.5	269.9	326	342	270.6	357.7
Azerbaijan	1,154	1,135	463	448	652.5	723.7	460	475	644.2	785.7
Bahamas (the)	497	666	40	42	170.5	222.8	34	38	123.5	188.6
Bahrain	1,246	1,324	635	627	599.9	725.2	789	773	890.8	1,052.8
Bangladesh	563	590	357	346	169.8	195.9	460	428	267.5	283.0
Barbados	17	17	5	5	6.2	6.8	5	5	6.3	7.4
Belarus	130	126	110	98	49.6	49.8	121	113	59.1	59.0
Belgium	770	789	608	596	421.1	495.3	670	693	507.4	646.4
Belize	25	27	15	16	15.3	19.7	16	16	16.4	20.3
Benin	11	9	8	8	3.5	3.5	9	9	4.0	4.0
Bermuda	40	29	<5	<5	20.9	21.5	<5	<5	19.6	24.7
Bhutan	9	8	11	12	3.4	3.6	12	15	4.3	5.6
Bolivia	<5	<5	<5	<5	1.0	1.5	<5	<5	1.1	2.1
Bosnia and Herzegovina	44	51	52	52	16.9	20.9	58	63	20.7	29.6
Botswana	17	28	19	23	5.6	11.8	25	23	9.3	13.7
Brazil	165	185	197	186	82.8	102.2	206	222	90.3	136.0
British Virgin Islands	151	152	32	30	43.9	48.7	32	32	44.0	53.4
Brunei	8	12	11	11	3.7	4.2	12	12	4.3	5.0
Bulgaria	223	230	209	209	106.4	123.9	224	232	121.4	150.9
Burkina Faso	<5	<5	<5	<5	1.3	1.4	<5	<5	2.0	2.1
Burundi	18	17	13	12	8.6	9.3	14	13	10.1	10.4
Cambodia	<5	<5	<5	<5	0.0	0.1	<5	<5	0.0	0.1
Cameroon	39	43	32	32	13.6	16.0	33	34	14.8	17.6
Canada	5,862	6,256	4,495	4,289	2,681.8	3,140.9	5,190	5,065	3,510.5	4,127.0
Cayman Islands	102	96	<5	<5	80.1	79.7	<5	<5	55.9	72.4
Central African Rep.	<5	<5	7	5	0.9	0.6	9	7	1.3	0.8
Chad	18	19	9	9	15.5	17.0	10	12	17.5	27.5
Chile	9	10	10	10	5.5	7.4	10	11	6.1	8.2
China	5,168	5,773	4,132	3,998	1,701.9	2,095.4	4,667	4,824	2,142.5	2,890.8
Colombia	56	64	66	67	34.5	39.4	74	79	43.0	54.2
Congo	21	26	16	18	14.2	16.8	18	21	17.2	25.2
Costa Rica	<5	5	<5	<5	0.9	1.5	<5	<5	0.9	1.8
Croatia	83	90	77	80	30.3	45.4	82	87	34.1	55.5
Cuba	<5	8	<5	<5	0.1	2.3	<5	<5	0.3	2.7
Curaçao									0.0	0.0
Cyprus	129	305	105	120	86.5	240.0	130	123	128.3	282.6
Czechia	130	156	120	133	73.9	92.8	128	146	83.5	120.5
Côte d'Ivoire	12	15	12	14	5.7	7.6	12	14	5.6	8.5

Notes: This table presents our estimates of ownership of Dubai residential real estate for every country. The estimates are broken down into estimates for the properties that are included in the leaks (Sandcastle 2020 and Sandcastle 2022) and for the whole city. We estimate the city-wide number of owners by assuming that half of the properties we don't observe in the leaked data are owned by owners who also own properties in the leak-based sample and half of the properties are owned by a totally new set of owners that on average own properties worth the same as the average value of the property portfolios (collection of properties owned by a given owner) we observe in the leak-based sample.

Table: Detailed Country-by-Country Main Results II

Country	Number of properties Leaks, 2020	Number of properties Leaks, 2022	Number of owners Leaks, 2020	Number of owners Leaks, 2022	Aggregate Value Leaks, 2020 USD mill.	Aggregate Value Leaks, 2022 USD mill.	Number of owners City-wide, 2020	Number of owners City-wide, 2022	Aggregate Value City-wide, 2020 USD mill.	Aggregate Value City-wide, 2022 USD mill.
Dem. Rep. Congo	<5	<5	<5	<5	1.3	0.8	<5	<5	1.3	0.9
Denmark	381	413	406	387	196.8	225.0	422	443	212.6	278.5
Djibouti	28	33	33	31	13.7	15.7	33	34	13.9	17.7
Dominica	137	177	50	70	72.1	100.2	74	77	142.3	147.7
Dominican Rep.	146	155	92	87	89.3	108.4	121	115	145.4	172.4
Ecuador	5	5	7	8	1.9	2.5	8	8	2.3	3.0
Egypt	4,782	5,355	4,304	4,087	2,025.9	2,432.7	4,884	4,918	2,571.6	3,292.7
El Salvador	<5	<5	<5	<5	1.3	0.6	<5	<5	1.3	0.7
Eritrea	117	128	60	59	52.5	59.5	68	64	66.5	68.8
Estonia	30	30	32	33	9.1	10.8	37	36	11.8	13.1
Eswatini	33	33	46	44	17.3	18.1	50	50	20.2	22.2
Ethiopia	166	191	142	141	67.4	83.2	159	157	83.6	101.7
Faroe Islands	<5	<5	<5	<5	0.1	0.1	<5	<5	0.4	0.1
Fiji	<5	<5	<5	<5	1.4	0.6	<5	<5	1.4	0.6
Finland	106	107	93	88	44.3	50.4	97	101	47.8	62.6
Foreign Gov. Org.	<5	<5	<5	<5	7.6	8.2	<5	<5	7.6	9.0
France	2,548	2,795	2,585	2,577	1,229.1	1,468.1	2,818	2,950	1,450.9	1,888.7
French Guiana									0.6	0.0
Gabon	16	19	9	7	10.2	9.6	9	7	9.7	8.2
Gambia	7	5	<5	<5	4.0	4.8	<5	<5	4.4	5.5
Georgia	18	19	17	17	9.1	10.2	17	20	9.7	13.9
Germany	2,079	2,172	1,653	1,663	1,081.5	1,287.0	1,792	1,903	1,263.0	1,666.0
Ghana	61	80	59	57	33.7	45.0	62	65	37.3	56.7
Gibraltar	6	129	<5	<5	5.2	92.0	<5	<5	0.7	103.9
Greece	484	495	420	408	229.3	261.4	488	490	303.3	359.1
Grenada	17	37	8	10	9.8	28.0	13	10	22.5	33.1
Guatemala	<5	<5	<5	<5	0.1	0.8	<5	<5	0.1	0.9
Guernsey	<5	38	<5	17	0.1	11.2	<5	11	0.1	14.2
Guinea	10	10	6	6	19.4	21.1	6	6	19.9	24.3
Guinea-Bissau	<5	6	5	5	1.4	2.1	5	5	1.4	2.3
Guyana		<5	<5	<5		0.1				0.1
Honduras	<5	<5	<5	<5	0.6	0.7	<5	<5	0.6	0.7
Hong Kong	99	152	35	52	38.5	59.8	36	48	40.5	71.0
Hungary	143	179	138	143	60.1	86.4	145	156	65.8	104.5
Iceland	5	<5	6	7	2.6	2.8	6	7	2.9	3.6
India	30,654	32,606	27,270	25,988	13,574.6	15,753.4	30,978	31,172	17,266.1	21,261.4
Indonesia	82	91	69	67	36.7	44.0	75	82	43.4	62.1
Iran	7,966	8,219	6,054	5,801	3,447.5	3,870.8	7,361	7,108	4,935.7	5,445.9
Iraq	2,969	3,107	2,067	1,966	1,213.4	1,449.0	2,366	2,343	1,564.5	1,929.6
Ireland	1,204	1,205	1,371	1,272	536.8	591.5	1,490	1,550	629.7	804.0
Isle of Man	5	111	<5	<5	2.2	44.7	<5	<5	2.2	8.4
Israel		<5		7		1.7				4.3
Italy	2,108	2,196	1,733	1,686	796.1	910.7	1,839	1,902	893.4	1,118.5
Jamaica	10	9	12	10	4.0	4.2	13	12	4.9	4.7
Japan	155	185	130	128	65.1	84.0	164	146	98.8	106.0
Jersey	25	25	8	7	21.1	14.3	8	8	21.1	18.0
Jordan	5,841	6,417	4,034	3,831	2,361.9	2,785.1	4,650	4,442	3,083.7	3,526.4
Kazakhstan	1,596	1,576	1,324	1,258	786.7	869.4	1,393	1,420	868.3	1,047.3
Kenya	672	680	634	612	252.2	288.0	714	707	316.0	366.6
Kosovo	<5	9	<5	6	0.4	2.8	<5	5	0.4	3.0

Notes: This table presents our estimates of ownership of Dubai residential real estate for every country. The estimates are broken down into estimates for the properties that are included in the leaks (Sandcastle 2020 and Sandcastle 2022) and for the whole city. We estimate the city-wide number of owners by assuming that half of the properties we don't observe in the leaked data are owned by owners who also own properties in the leak-based sample and half of the properties are owned by a totally new set of owners that on average own properties worth the same as the average value of the property portfolios (collection of properties owned by a given owner) we observe in the leak-based sample.

Table: Detailed Country-by-Country Main Results III

Country	Number of properties Leaks, 2020	Number of properties Leaks, 2022	Number of owners Leaks, 2020	Number of owners Leaks, 2022	Aggregate Value Leaks, 2020 USD mill.	Aggregate Value Leaks, 2022 USD mill.	Number of owners City-wide, 2020	Number of owners City-wide, 2022	Aggregate Value City-wide, 2020 USD mill.	Aggregate Value City-wide, 2022 USD mill.
Kuwait	2,997	3,803	1,942	1,930	1,099.8	1,770.6	2,585	2,230	1,828.1	2,309.7
Kyrgyzstan	101	140	91	85	36.4	55.9	97	99	41.4	69.9
Latvia	74	75	68	64	42.9	53.9	73	72	49.8	64.6
Lebanon	3,828	4,069	3,509	3,356	1,842.6	2,126.4	3,799	3,787	2,146.8	2,575.2
Lesotho	<5	7	<5	5	1.1	3.2	5	5	1.8	4.0
Liberia	<5	5	<5	<5	1.6	1.7	<5	<5	1.6	1.8
Libya	544	580	320	312	278.2	328.1	377	401	378.2	506.8
Liechtenstein	<5	<5	<5	<5	0.3	1.4	<5	<5	0.3	1.6
Lithuania	95	105	87	91	27.3	44.5	87	108	27.0	63.2
Luxembourg	38	45	34	37	18.9	23.7	35	41	20.3	30.8
Macao	<5	<5	<5	<5	0.1	0.1	<5		0.1	0.2
Madagascar	19	17	36	36	4.9	5.5	42	38	6.6	6.2
Malawi	40	37	24	22	8.0	7.5	28	25	10.5	8.7
Malaysia	308	331	316	306	134.6	154.4	406	408	211.6	252.4
Maldives	16	17	12	13	5.8	7.0	13	14	6.5	8.7
Mali	15	15	10	10	7.8	8.6	12	11	11.5	10.4
Malta	148	168	84	88	103.5	123.8	91	97	120.7	154.1
Mauritania	16	17	17	18	3.5	6.6	18	19	4.0	7.4
Mauritius	82	86	89	89	37.5	41.9	94	96	41.3	48.9
Mexico	71	71	79	73	38.5	41.1	82	84	41.8	49.9
Moldova	36	33	31	34	11.5	12.4	33	37	12.8	15.7
Monaco	<5	<5	<5	<5	1.7	1.8	<5	<5	1.7	2.0
Mongolia	<5	<5	<5	<5	1.0	1.1	<5	<5	1.0	1.2
Montenegro	6	8	6	6	3.2	4.1	6	6	3.2	4.4
Morocco	673	748	504	473	272.2	319.8	563	579	335.8	442.1
Mozambique	243	246	49	48	39.4	47.9	63	56	61.4	62.0
Myanmar	12	13	15	15	2.9	3.6	15	17	3.1	4.4
Namibia	<5	7	<5	<5	1.7	2.0	<5	<5	1.8	2.2
Nauru									0.1	0.0
Nepal	67	80	63	60	33.4	43.2	72	72	42.8	58.2
Netherlands	943	1,015	850	863	533.2	639.9	897	973	592.4	813.2
New Zealand	326	330	380	360	148.5	166.2	454	452	206.6	242.0
Nicaragua	<5	<5	<5	<5	0.7	0.8	<5	<5	0.7	0.9
Niger	29	26	22	19	11.3	11.5	26	21	15.9	11.9
Nigeria	1,345	1,347	1,097	1,038	519.2	592.9	1,165	1,178	583.9	719.5
North Korea	19	20	16	15	9.7	10.1	16	18	10.2	14.1
North Macedonia	37	37	40	39	11.0	13.8	44	43	13.0	16.0
Norway	215	225	200	193	83.1	95.7	214	227	94.5	125.5
Oman	1,788	1,932	610	606	555.7	673.3	974	891	1,219.3	1,303.3
Pakistan	21,854	22,250	16,582	15,633	5,657.4	6,438.1	20,033	18,691	8,012.4	8,565.8
Palau									0.2	0.1
Palestine	1,344	1,445	822	784	371.2	445.4	1,016	930	546.7	589.2
Panama	<5	6	5	6	2.4	3.1	5	6	2.5	3.7
Papua New Guinea	<5	<5	<5	<5	1.5	1.6	<5	<5	1.7	1.8
Paraguay	<5	<5	<5	<5	0.4	0.5	<5	<5	0.4	0.5
Peru	9	9	11	11	3.5	4.3	13	12	5.1	5.2
Philippines	193	204	259	245	66.2	78.8	273	287	73.3	101.5
Poland	239	260	246	251	97.7	125.3	266	277	113.4	154.0
Portugal	401	439	272	269	156.8	186.5	296	310	184.7	240.9
Puerto Rico	6	8	7	6	3.6	4.3	7	7	3.6	5.3

Notes: This table presents our estimates of ownership of Dubai residential real estate for every country. The estimates are broken down into estimates for the properties that are included in the leaks (Sandcastle 2020 and Sandcastle 2022) and for the whole city. We estimate the city-wide number of owners by assuming that half of the properties we don't observe in the leaked data are owned by owners who also own properties in the leak-based sample and half of the properties are owned by a totally new set of owners that on average own properties worth the same as the average value of the property portfolios (collection of properties owned by a given owner) we observe in the leak-based sample.

Table: Detailed Country-by-Country Main Results IV

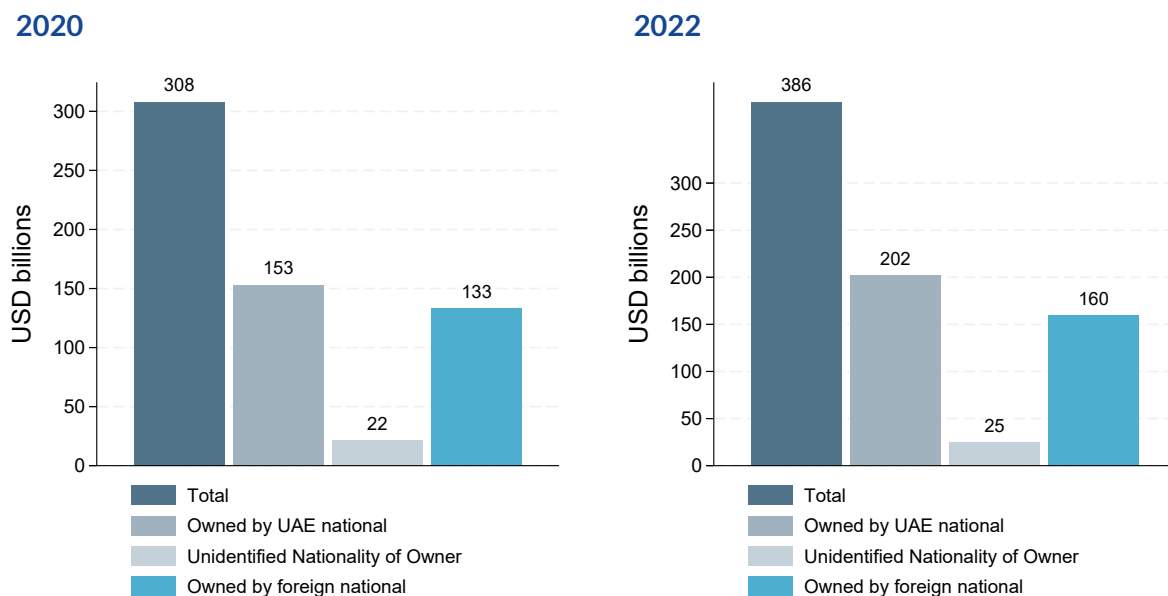
Country	Number of properties	Number of properties	Number of owners	Number of owners	Aggregate Value	Aggregate Value	Number of owners	Number of owners	Aggregate Value	Aggregate Value
	Leaks, 2020	Leaks, 2022	Leaks, 2020	Leaks, 2022	Leaks, 2020 USD mill.	Leaks, 2022 USD mill.	City-wide, 2020	City-wide, 2022	City-wide, 2020 USD mill.	City-wide, 2022 USD mill.
Qatar	2,071	2,389	677	712	896.2	1,226.4	898	916	1,482.1	1,989.1
Romania	241	275	264	269	86.7	116.5	339	343	135.8	182.4
Russia	5,411	5,953	4,298	4,608	2,493.5	3,061.3	4,550	4,928	2,786.5	3,692.8
Rwanda	47	40	22	22	17.9	18.7	26	25	24.2	24.3
Saint Kitts and Nevis	978	1,036	325	318	600.3	700.2	342	354	664.4	842.7
Saint Lucia	<5	<5	<5	<5	0.3	0.8	<5	<5	2.1	1.2
Saint Vincent and Gren.	<5	<5	<5	<5	1.1	1.2	<5	<5	1.1	1.3
Samoa	<5	<5	<5	<5	6.5	7.0	<5	<5	6.5	7.7
San Marino	<5	<5	<5	<5	0.5	0.5	<5	<5	<5	0.0
Saudi Arabia	11,414	13,581	5,896	5,923	5,668.9	7,292.8	6,671	7,014	7,158.7	10,012.7
Senegal	22	35	19	20	22.6	57.9	19	22	23.7	71.8
Serbia	167	175	212	201	62.9	71.2	224	228	70.0	86.7
Seychelles	133	132	47	43	50.6	54.4	59	49	75.5	64.5
Sierra Leone	23	27	9	10	11.6	14.5	11	10	17.5	16.3
Singapore	614	690	478	466	379.9	449.0	498	523	411.0	547.6
Slovakia	96	106	84	80	31.4	44.7	90	91	36.2	54.6
Slovenia	44	38	41	38	28.8	30.7	42	42	30.6	34.8
Somalia	30	29	26	24	8.1	6.1	30	27	10.3	7.0
South Africa	1,227	1,307	1,153	1,098	440.8	529.4	1,274	1,273	533.0	671.3
South Korea	240	256	239	229	109.3	133.2	258	274	127.1	180.3
South Sudan	14	13	6	5	5.5	5.4	6	6	6.3	5.8
Spain	372	385	417	418	176.3	210.6	440	461	195.3	254.6
Sri Lanka	267	292	309	276	98.5	118.7	340	340	118.4	159.8
Sudan	1,592	1,721	1,309	1,230	561.7	654.3	1,505	1,455	730.3	851.7
Sweden	660	697	643	631	345.2	393.3	686	710	391.4	483.8
Switzerland	645	704	570	585	440.5	534.4	589	638	470.3	644.1
Syria	4,811	5,067	3,331	3,167	1,482.9	1,727.4	4,754	4,264	2,749.4	2,835.2
Taiwan	45	46	19	18	18.0	20.1	20	20	19.3	22.9
Tajikistan	177	173	92	84	67.3	83.6	102	96	81.9	99.9
Tanzania	355	412	311	295	124.7	158.3	407	360	201.9	219.8
Thailand	79	193	70	70	36.3	99.5	83	64	49.4	82.3
The Comoros	96	105	82	76	34.3	40.2	95	97	45.3	59.3
Togo	<5	<5	<5	<5	0.2	0.5	<5	<5	0.2	0.6
Trinidad and Tobago	8	8	8	9	3.1	3.5	8	9	3.1	3.8
Tunisia	338	369	324	299	133.9	157.1	363	353	166.0	200.3
Turkey	794	905	743	729	398.1	485.2	819	828	480.1	607.9
Turkmenistan	235	233	172	163	100.5	113.3	187	184	118.3	136.2
Turks and Caicos Islands	5	5	<5	<5	2.3	2.5	<5	<5	2.3	2.8
USA	4,372	4,598	3,939	3,775	1,791.5	2,053.2	4,333	4,357	2,149.9	2,596.7
Uganda	63	94	47	49	27.2	46.6	53	50	34.4	49.7
Ukraine	571	603	521	532	244.7	299.1	560	611	281.3	394.6
United Arab Emirates	162,956	186,049	13,437	13,571	46,342.9	59,988.0	22,814	23,180	111,024.1	145,531.7
United Kingdom	19,532	20,351	18,192	17,567	8,564.0	9,838.6	19,839	20,449	10,114.5	12,717.2
Unknown	35,998	44,718	7,189	14,762	11,630.6	16,779.5	8,174	12,428	14,818.3	20,082.0
Uruguay	13	13	7	5	3.7	4.1	7	6	3.9	4.6
Uzbekistan	466	438	395	363	231.3	245.5	504	440	359.3	328.4
Vanuatu	<5	13	<5	<5	0.8	20.1	<5	<5	5.1	36.8
Venezuela	53	57	56	51	21.5	26.0	59	60	24.0	32.6
Viet Nam	13	11	14	11	5.0	6.5	15	13	5.5	7.2
Yemen	2,213	2,274	664	624	686.1	774.2	801	720	969.5	962.5
Zambia	49	49	49	46	14.7	19.3	56	55	18.9	25.7
Zimbabwe	72	77	57	55	21.6	30.9	61	66	24.6	41.6

Notes: This table presents our estimates of ownership of Dubai residential real estate for every country. The estimates are broken down into estimates for the properties that are included in the leaks (Sandcastle 2020 and Sandcastle 2022) and for the whole city. We estimate the city-wide number of owners by assuming that half of the properties we don't observe in the leaked data are owned by owners who also own properties in the leak-based sample and half of the properties are owned by a totally new set of owners that on average own properties worth the same as the average value of the property portfolios (collection of properties owned by a given owner) we observe in the leak-based sample.

D Figures when off-plan properties are included

FIGURE A2

Value of Existing and Off-Plan Residential in Dubai

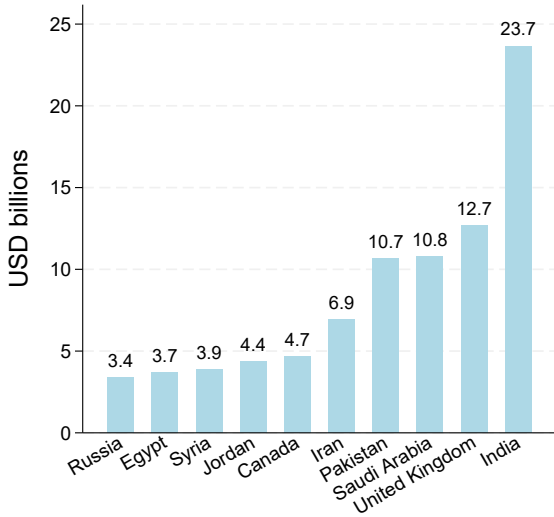


Notes: These figures show our estimate of the value of existing and off-plan residential real estate in Dubai, first in aggregate, then broken down on three categories: Real estate owned by local nationals, real estate owned by companies or firms where we are uncertain about the ultimate owners' nationality and real estate owned by foreign nationals. All values are reported in nominal USD billions (1 AED is pegged to 0.272 USD).

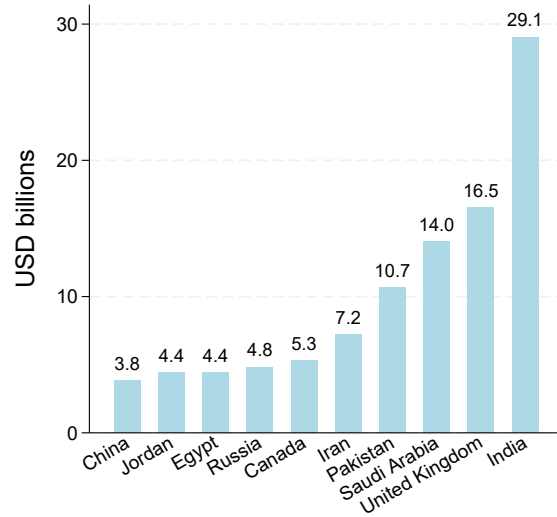
FIGURE A3

Value of Existing and Off-Plan Residential in Dubai in 2020 and 2022: Top 10 Countries

2020



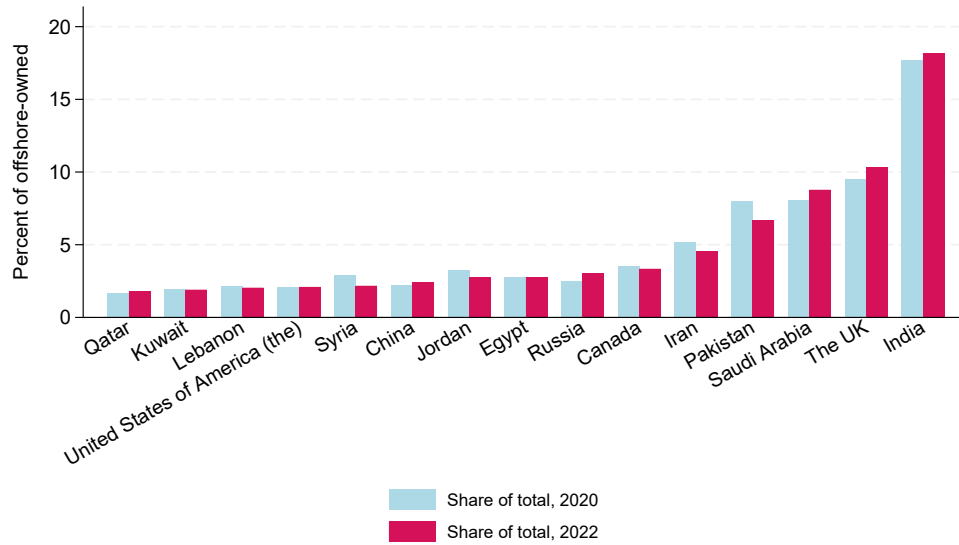
2022



Notes: This figure presents our estimates of the value of the existing and off-plan residential foreign-owned real estate in Dubai in 2020 and 2022 by the country of the owner. It shows the top 10 countries (other than the United Arab Emirates). Values are reported in USD billions (1 AED is pegged to 0.272 USD). The methodology behind the estimates of the property values and apportionment to countries are outlined in section 3. Results for all countries are shown in appendix section C.

FIGURE A4

Share of Foreign-owned Existing and Off-Plan Residential in Dubai (2020 and 2022)

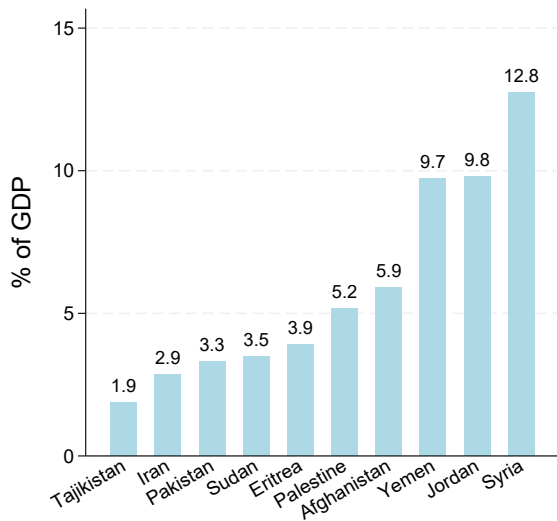


Notes: This figure presents the ownership of existing and off-plan residential real estate in Dubai in 2020 and 2022 by the country of the owner. The ownership is shown as a share of the total foreign ownership, meaning that a stable percentage share imply growth in the value of the nominal ownership. The rise in value of the total foreign ownership is shown in figure A2 and the nominal USD values for individual countries are shown in figure A3 and appendix section C.

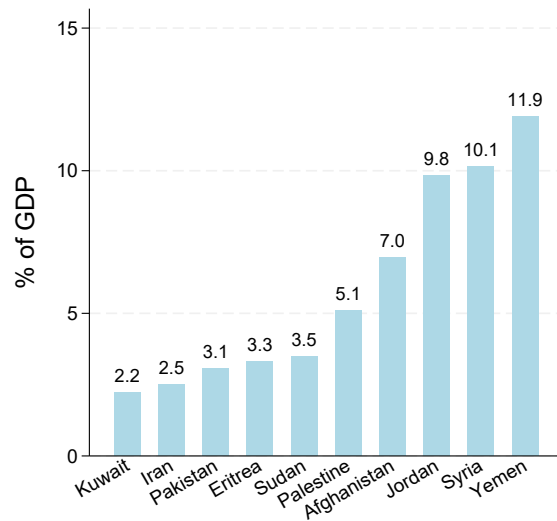
FIGURE A5

Value of Existing and Off-Plan Residential in Dubai relative to GDP: Top 10 Countries

2020



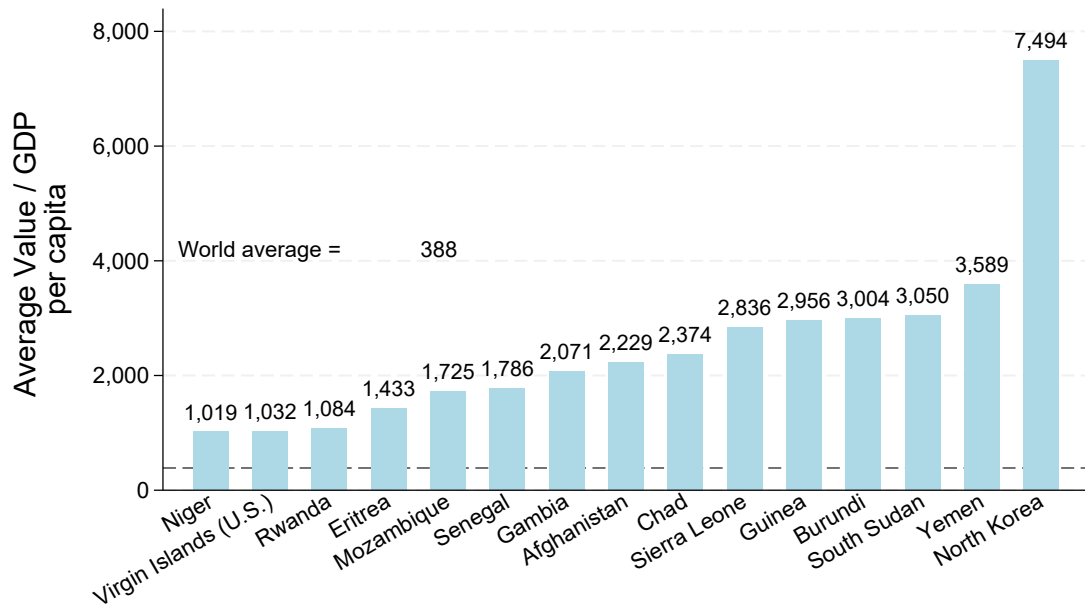
2022



Notes: This figure shows the value of the existing and off-plan residential foreign-owned real estate in Dubai in 2020 and 2022 by the country of the owner compared to GDP in the home country. It shows the top 10 countries (other than the United Arab Emirates, tax havens and citizenship-by-investment countries, see lists in [Alstadsæter et al. \(2022\)](#)). The GDP numbers are for 2019 and 2021, as the estimates of real estate ownership is from the first half of the respective years. The GDP series used is custom and developed by this method: We choose the one that has the best 2000-2022 coverage from 5 potential sources (UN, IMF's WEO, WB, External Wealth of Nations, and WID). We then use the list in that order of preference to choose between ties.

FIGURE A6

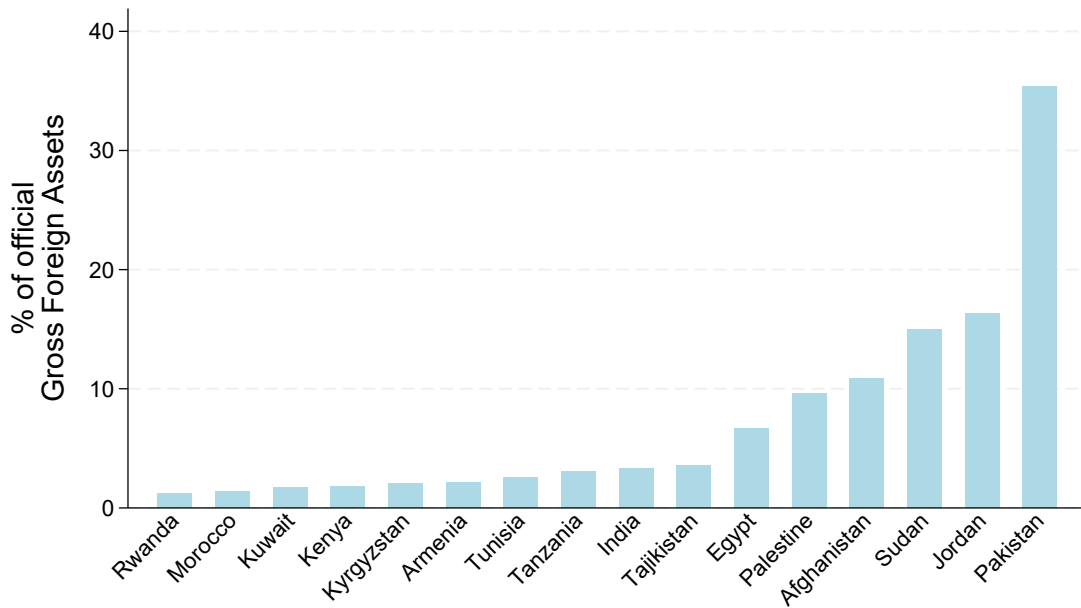
Average Value of Existing and Off-Plan Residential in Dubai Compared to Mean Income (2022)



Notes: This figure shows the average value of the existing and off-plan residential real estate held by each owner from different countries compared to the GDP per capita in the home country. A value of 1,000 means that the owners from a country on average hold real estate in Dubai which amounts to 1,000 times the GDP per capita in that country. The GDP series used is custom and developed by this method: We choose the one that has the best 2000-2022 coverage from 5 potential sources (UN, IMF's WEO, WB, External Wealth of Nations, and WID). We then use the list in that order of preference to choose between ties. The population series is from the World Bank.

FIGURE A7

Value of Existing and Off-Plan Residential Real Estate in Dubai as % of Recorded Gross Foreign Assets (2022)



Notes: This figure compares the existing and off-plan residential real estate assets in Dubai to other foreign ownership statistics. It shows the value of Dubai real estate compared to the officially recorded gross foreign assets (excluding monetary gold), as recorded in the [International Investment Position database](#) published by the IMF. We compare the early 2022 residential real estate wealth to the 2021 IIP statistics, with the exception of Afghanistan, where the 2020 data is the last available.

E Country-by-Country Results with off-plan properties

Table: Detailed Country-by-Country Results when off-plan properties are included I

Country	Number of properties Leaks, 2020	Number of properties Leaks, 2022	Number of owners Leaks, 2020	Number of owners Leaks, 2022	Aggregate Value Leaks, 2020 USD mill.	Aggregate Value Leaks, 2022 USD mill.	Number of owners City-wide, 2020	Number of owners City-wide, 2022	Aggregate Value City-wide, 2020 USD mill.	Aggregate Value City-wide, 2022 USD mill.
Afghanistan	1,931	1,880	966	917	780.6	835.0	1,161	1,109	1,095.8	1,139.3
Albania	13	21	16	24	7.2	12.9	17	27	8.1	20.2
Algeria	1,072	972	737	669	347.7	360.8	837	944	441.8	620.3
American Samoa	<5	<5	<5	<5	1.3	1.4	<5	<5	1.4	1.6
Andorra	<5	<5	<5	<5	0.1	0.1	<5	<5	0.1	0.2
Angola	98	93	34	34	35.6	37.9	35	76	38.7	131.1
Anguilla		<5		<5		0.3			0.3	0.4
Antigua and Barbuda	22	47	12	17	15.9	27.7	23	20	45.8	44.5
Argentina	179	149	87	85	51.0	53.3	93	113	58.3	87.0
Armenia	205	186	167	167	80.7	88.7	199	218	111.2	143.3
Aruba									0.2	0.0
Australia	1,643	1,602	1,582	1,506	772.1	820.5	1,883	2,035	1,065.6	1,355.3
Austria	437	438	337	335	263.2	290.2	413	434	381.7	460.4
Azerbaijan	1,243	1,183	510	493	699.1	747.6	526	562	743.9	932.4
Bahamas (the)	631	764	46	48	216.4	262.8	41	53	167.3	327.9
Bahrain	1,485	1,443	791	787	730.9	786.6	1,012	1,041	1,138.5	1,290.5
Bangladesh	657	641	405	394	211.2	225.3	562	532	375.3	377.4
Barbados	17	17	5	5	6.2	6.8	5	5	6.4	7.8
Belarus	158	139	127	112	55.6	52.5	143	137	69.3	68.9
Belgium	850	838	654	650	475.6	525.7	776	837	653.2	824.4
Belize	29	29	17	19	19.5	21.6	19	19	24.1	24.1
Benin	11	9	8	8	3.5	3.5	9	9	4.2	4.6
Bermuda	40	29	<5	<5	20.9	21.5	<5	<5	21.0	31.6
Bhutan	9	8	11	12	3.4	3.6	13	19	4.7	8.0
Bolivia	<5	<5	5	5	1.4	1.5	5	6	1.5	2.2
Bosnia and Herzegovina	51	57	56	55	19.7	23.8	66	75	26.7	40.9
Botswana	26	31	26	31	10.9	13.3	33	32	16.5	16.0
Brazil	200	197	222	212	102.1	110.6	244	288	122.7	184.6
British Virgin Islands	161	161	35	33	59.4	52.0	35	37	59.3	59.9
Brunei	8	12	11	11	3.8	4.2	19	13	9.1	6.0
Bulgaria	239	240	221	223	117.1	129.5	245	275	142.5	190.9
Burkina Faso	5	<5	<5	<5	2.1	1.9	14	5	12.9	2.7
Burundi	19	17	15	14	8.8	9.3	18	16	12.0	11.0
Cambodia	<5	<5	<5	<5	0.0	0.1	<5	<5	0.0	0.1
Cameroon	50	46	42	36	17.4	17.2	46	44	20.6	22.0
Canada	6,782	6,640	5,068	4,845	3,089.7	3,321.8	6,372	6,432	4,679.1	5,345.5
Cayman Islands	455	433	<5	<5	265.6	269.7	<5	<5	152.8	227.8
Central African Rep.	<5	<5	7	5	0.9	0.6	10	7	1.6	0.8
Chad	20	20	11	11	16.3	17.9	12	15	19.3	30.5
Chile	32	17	18	16	15.0	12.1	18	18	15.7	13.5
China	6,474	6,463	4,916	4,773	2,156.8	2,354.1	5,844	6,359	2,970.9	3,847.7
Colombia	63	68	73	74	36.1	40.5	92	95	54.7	64.2
Congo	27	29	18	20	16.6	18.4	21	32	22.5	42.1
Costa Rica	<5	5	<5	<5	1.1	1.5	<5	5	1.1	2.5
Croatia	97	96	88	93	42.3	48.4	96	117	49.6	76.1
Cuba	<5	8	<5	5	0.7	2.3	<5	5	1.3	3.4
Curaçao									0.1	0.0
Cyprus	159	347	122	140	107.4	290.0	242	153	318.0	379.8
Czechia	157	169	133	149	85.2	100.5	144	186	99.7	161.3
Côte d'Ivoire	31	28	21	22	9.9	11.5	21	25	10.0	14.8

Notes: This table presents our estimates of ownership of Dubai residential real estate for every country. The estimates are broken down into estimates for the properties that are included in the leaks (Sandcastle 2020 and Sandcastle 2022) and for the whole city. We estimate the city-wide number of owners by assuming that half of the properties we don't observe in the leaked data are owned by owners who also own properties in the leak-based sample and half of the properties are owned by a totally new set of owners that on average own properties worth the same as the average value of the property portfolios (collection of properties owned by a given owner) we observe in the leak-based sample. This table aggregates results for both existing and off-plan properties. See appendix C for the same table for existing properties only.

Table: Detailed Country-by-Country Results when off-plan properties are included II

Country	Number of properties Leaks, 2020	Number of properties Leaks, 2022	Number of owners Leaks, 2020	Number of owners Leaks, 2022	Aggregate Value Leaks, 2020 USD mill.	Aggregate Value Leaks, 2022 USD mill.	Number of owners City-wide, 2020	Number of owners City-wide, 2022	Aggregate Value City-wide, 2020 USD mill.	Aggregate Value City-wide, 2022 USD mill.
Dem. Rep. Congo	<5	<5	<5	<5	1.3	0.8	<5	<5	1.3	0.9
Denmark	482	477	480	441	235.5	255.1	520	575	274.4	387.6
Djibouti	31	33	36	34	14.7	15.7	38	39	16.3	19.8
Dominica	151	191	53	76	78.1	110.5	108	96	241.3	202.3
Dominican Rep.	189	172	102	97	116.7	120.9	138	146	199.8	235.8
Ecuador	6	5	8	8	3.2	2.5	8	9	3.5	3.2
Egypt	6,213	5,946	5,393	5,157	2,525.9	2,661.6	6,620	6,993	3,675.6	4,435.2
El Salvador	<5	<5	<5	<5	1.3	0.6	<5	<5	1.3	0.7
Eritrea	131	130	69	67	55.3	59.8	83	76	77.7	74.7
Estonia	31	30	33	35	9.4	10.9	42	40	14.3	14.9
Eswatini	36	35	49	47	18.0	18.5	54	55	21.7	24.3
Ethiopia	216	221	190	187	90.1	102.0	243	223	140.2	139.9
Faroe Islands	<5	<5	<5	<5	0.1	0.1	<5	<5	0.4	0.1
Fiji	<5	<5	<5	<5	1.4	0.6	<5	<5	1.4	0.7
Finland	127	119	109	105	52.0	57.0	117	134	59.3	85.9
Foreign Gov. Org.	<5	<5	<5	<5	7.6	8.2	<5	<5	7.6	9.5
France	2,988	3,073	2,930	2,982	1,417.3	1,595.2	3,389	3,722	1,861.3	2,414.7
French Guiana									10.2	0.0
Gabon	17	19	10	8	10.8	9.6	11	9	13.1	9.2
Gambia	8	5	<5	<5	4.3	4.8	<5	<5	5.0	6.1
Georgia	18	20	17	19	9.1	11.6	18	25	10.6	20.7
Germany	2,735	2,791	1,863	1,879	1,283.1	1,451.0	2,107	2,353	1,618.5	2,196.0
Ghana	108	107	92	91	51.2	57.4	99	110	59.2	81.4
Gibraltar	132	129	<5	<5	84.7	92.0	<5	<5	80.3	136.3
Greece	669	658	469	455	316.0	346.0	565	570	445.5	510.3
Grenada	21	43	8	11	13.4	30.4	18	11	46.3	40.2
Guatemala	<5	<5	<5	<5	0.7	0.8	<5	<5	0.7	0.9
Guernsey	<5	38	<5	17	0.1	11.2	<5	15	0.1	19.5
Guinea	10	10	6	6	19.4	21.1	6	7	20.9	25.8
Guinea-Bissau	<5	6	5	5	1.9	2.1	5	5	1.9	2.4
Guyana		<5	<5	<5		0.1				0.2
Honduras	<5	<5	<5	<5	0.6	0.7	<5	<5	0.6	0.8
Hong Kong	128	185	41	62	46.0	67.0	43	65	49.8	95.6
Hungary	183	193	162	177	75.0	94.2	178	214	89.5	142.1
Iceland	5	5	6	7	2.6	3.7	7	9	3.3	6.0
India	36,660	35,197	31,168	29,780	16,115.1	17,163.2	38,467	40,792	23,663.1	29,056.3
Indonesia	98	95	84	81	44.8	46.7	96	124	57.5	95.2
Iran	9,617	9,402	7,096	6,826	4,110.3	4,403.4	9,519	9,157	6,916.9	7,236.5
Iraq	3,589	3,431	2,325	2,216	1,509.6	1,609.8	2,896	2,937	2,251.3	2,578.2
Ireland	1,379	1,314	1,556	1,438	588.8	622.6	1,810	1,966	781.0	1,028.7
Isle of Man	5	111	<5	<5	2.2	44.7	<5	<5	2.2	11.1
Israel		9		12		5.3				14.4
Italy	2,537	2,502	2,101	2,022	925.8	1,007.8	2,312	2,495	1,111.9	1,440.2
Jamaica	12	11	15	13	4.3	4.5	18	15	5.9	5.3
Japan	201	224	158	153	88.7	103.8	203	191	138.9	152.5
Jersey	30	25	9	7	22.5	14.3	9	10	22.4	23.6
Jordan	7,143	6,924	4,857	4,602	2,850.7	3,017.5	6,143	5,808	4,360.6	4,431.7
Kazakhstan	1,911	1,739	1,457	1,360	896.9	932.6	1,582	1,704	1,051.1	1,338.1
Kenya	769	725	725	703	293.3	311.0	862	884	404.0	461.2
Kosovo	<5	11	<5	7	0.4	4.9	<5	6	0.4	5.4

Notes: This table presents our estimates of ownership of Dubai residential real estate for every country. The estimates are broken down into estimates for the properties that are included in the leaks (Sandcastle 2020 and Sandcastle 2022) and for the whole city. We estimate the city-wide number of owners by assuming that half of the properties we don't observe in the leaked data are owned by owners who also own properties in the leak-based sample and half of the properties are owned by a totally new set of owners that on average own properties worth the same as the average value of the property portfolios (collection of properties owned by a given owner) we observe in the leak-based sample. This table aggregates results for both existing and off-plan properties (planned properties that are sold before the project is completed). See appendix C for the same table for existing properties only.

Table: Detailed Country-by-Country Results when off-plan properties are included III

Country	Number of properties Leaks, 2020	Number of properties Leaks, 2022	Number of owners Leaks, 2020	Number of owners Leaks, 2022	Aggregate Value Leaks, 2020 USD mill.	Aggregate Value Leaks, 2022 USD mill.	Number of owners City-wide, 2020	Number of owners City-wide, 2022	Aggregate Value City-wide, 2020 USD mill.	Aggregate Value City-wide, 2022 USD mill.
Kuwait	4,381	4,326	2,585	2,574	1,776.3	1,974.4	3,161	3,278	2,568.3	3,045.3
Kyrgyzstan	181	170	111	105	71.3	75.4	112	128	72.9	104.8
Latvia	87	80	76	72	46.7	55.7	88	90	61.5	80.5
Lebanon	4,509	4,396	3,966	3,800	2,126.4	2,262.6	4,673	4,725	2,885.1	3,265.8
Lesotho	6	7	5	6	2.5	3.2	8	6	5.2	4.2
Liberia	<5	5	<5	<5	1.6	1.7	<5	<5	1.6	2.0
Libya	625	604	349	340	323.2	341.2	489	516	582.6	684.7
Liechtenstein	<5	<5	<5	<5	1.1	2.2	<5	<5	1.1	3.0
Lithuania	108	119	97	103	31.3	51.7	96	139	30.5	90.8
Luxembourg	43	52	37	46	20.7	26.4	45	56	29.6	42.9
Macao	<5	<5	<5	<5	0.3	0.1	<5	<5	0.3	0.2
Madagascar	20	17	38	37	5.2	5.5	46	41	7.4	6.6
Malawi	44	41	28	27	10.4	9.9	33	30	14.3	11.7
Malaysia	366	348	348	335	151.9	160.9	467	507	255.3	320.0
Maldives	21	21	16	17	7.5	8.6	18	19	9.0	11.5
Mali	17	17	13	13	8.4	9.1	17	16	13.5	12.9
Malta	166	180	93	98	111.4	127.8	103	125	135.6	205.0
Marshall Islands (the)		<5		<5		0.6				0.6
Mauritania	20	19	21	22	6.5	7.1	23	23	7.7	8.3
Mauritius	94	92	97	97	44.0	44.8	106	115	52.5	61.8
Mexico	79	77	85	80	40.6	45.8	91	101	46.5	67.3
Moldova	42	38	37	42	13.0	14.4	41	52	15.8	23.2
Monaco	<5	<5	<5	<5	1.8	2.0	<5	<5	1.8	2.2
Mongolia	<5	<5	<5	<5	1.0	1.1	<5	<5	1.0	1.2
Montenegro	9	8	7	7	3.7	4.1	7	8	3.7	4.7
Morocco	912	891	586	550	361.0	382.5	688	830	486.7	746.6
Mozambique	263	253	60	58	48.2	49.2	79	71	79.4	69.4
Myanmar	13	14	16	17	3.1	3.8	17	19	3.3	5.1
Namibia	6	8	<5	<5	2.0	2.1	<5	<5	2.2	2.5
Nauru									0.3	0.0
Nepal	84	85	78	75	43.4	46.1	90	113	56.8	90.3
Netherlands	1,136	1,136	957	975	648.8	728.1	1,051	1,255	776.1	1,159.9
New Zealand	367	354	425	404	168.6	179.6	534	584	255.4	330.5
Nicaragua	<5	<5	<5	<5	0.7	0.8	<5	<5	0.7	0.9
Niger	37	28	24	20	14.2	12.0	31	23	22.1	13.4
Nigeria	1,481	1,436	1,189	1,126	573.9	622.3	1,326	1,432	706.0	926.0
North Korea	25	24	22	21	12.3	12.1	23	29	13.3	20.6
North Macedonia	41	39	43	42	12.5	15.4	49	49	15.9	19.9
Norway	252	249	234	223	93.9	104.4	263	300	117.0	171.1
Oman	2,163	2,162	851	861	727.0	796.9	1,372	1,309	1,616.5	1,634.6
Pakistan	24,503	23,489	18,191	17,165	6,551.5	6,973.8	23,902	22,245	10,665.2	10,684.9
Palau									0.2	0.1
Palestine	1,634	1,564	1,024	977	450.7	481.0	1,520	1,448	886.9	921.5
Panama	5	6	6	6	2.6	3.1	6	7	2.9	4.6
Papua New Guinea	<5	<5	<5	<5	1.5	1.6	<5	<5	1.7	1.9
Paraguay	<5	<5	<5	<5	0.4	0.5	<5	<5	0.4	0.5
Peru	15	14	13	13	4.8	5.2	16	15	6.7	6.9
Philippines	236	226	309	292	79.6	86.3	341	394	96.0	141.3
Poland	267	279	267	274	114.7	136.9	312	345	153.5	211.2
Portugal	452	466	312	306	182.5	200.4	382	398	264.1	317.6

Notes: This table presents our estimates of ownership of Dubai residential real estate for every country. The estimates are broken down into estimates for the properties that are included in the leaks (Sandcastle 2020 and Sandcastle 2022) and for the whole city. We estimate the city-wide number of owners by assuming that half of the properties we don't observe in the leaked data are owned by owners who also own properties in the leak-based sample and half of the properties are owned by a totally new set of owners that on average own properties worth the same as the average value of the property portfolios (collection of properties owned by a given owner) we observe in the leak-based sample. This table aggregates results for both existing and off-plan properties (planned properties that are sold before the project is completed). See appendix C for the same table for existing properties only.

Table: Detailed Country-by-Country Results when off-plan properties are included IV

Country	Number of properties	Number of properties	Number of owners	Number of owners	Aggregate Value	Aggregate Value	Number of owners	Number of owners	Aggregate Value	Aggregate Value
	Leaks, 2020	Leaks, 2022	Leaks, 2020	Leaks, 2022	Leaks, 2020 USD mill.	Leaks, 2022 USD mill.	City-wide, 2020	City-wide, 2022	City-wide, 2020 USD mill.	City-wide, 2022 USD mill.
Puerto Rico	7	8	8	8	3.9	4.3	8	10	3.9	6.5
Qatar	2,934	2,931	1,140	1,190	1,410.8	1,516.7	1,460	1,688	2,203.2	2,850.6
Romania	300	304	306	315	106.0	126.5	408	461	176.9	247.4
Russia	6,123	6,638	4,775	5,182	2,763.9	3,334.3	5,297	6,146	3,368.3	4,836.8
Rwanda	51	40	25	22	20.7	19.6	33	29	33.6	29.1
Saint Kitts and Nevis	1,245	1,214	373	363	748.1	803.3	426	444	958.8	1,140.6
Saint Lucia	<5	<5	<5	<5	0.3	0.8	7	<5	3.6	2.1
Saint Vincent and Gren.	<5	<5	<5	<5	1.1	1.2	<5	<5	1.1	1.4
Samoa	<5	<5	<5	<5	6.5	7.0	<5	<5	6.5	8.1
San Marino	<5	<5	<5	<5	0.5	0.5	<5	<5	<5	0.1
Saudi Arabia	16,231	16,095	8,437	8,489	7,894.2	8,523.6	9,992	11,205	10,804.6	14,029.1
Senegal	44	45	23	24	56.9	70.0	24	29	59.5	103.2
Serbia	194	195	237	218	69.4	81.0	264	276	85.4	116.9
Seychelles	143	139	54	50	54.2	56.7	72	58	90.5	70.6
Sierra Leone	26	33	10	11	14.9	15.7	19	12	41.1	19.2
Singapore	707	728	555	546	439.1	490.8	603	668	514.4	701.4
Slovakia	110	113	95	94	40.7	49.2	108	115	52.0	70.2
Slovenia	46	40	44	42	29.2	32.1	47	47	32.7	38.3
Somalia	39	36	34	31	10.0	7.1	44	41	15.9	10.9
South Africa	1,432	1,380	1,325	1,269	522.6	564.9	1,567	1,656	713.9	884.5
South Korea	288	275	275	263	130.1	141.7	338	344	189.8	222.9
South Sudan	16	15	6	5	6.2	6.1	7	6	7.9	6.9
Spain	430	429	472	475	204.4	231.9	518	570	244.3	326.1
Sri Lanka	341	322	366	333	125.7	129.9	465	476	193.7	229.0
Sudan	2,177	2,057	1,646	1,555	737.0	761.5	2,080	2,041	1,125.9	1,192.6
Sweden	814	797	762	753	403.0	432.9	855	943	501.1	646.5
Switzerland	733	789	620	642	487.7	576.0	671	786	567.9	853.6
Syria	5,624	5,392	3,916	3,716	1,752.6	1,849.4	6,266	5,452	3,856.3	3,477.7
Taiwan	57	54	30	29	21.8	23.1	32	33	24.5	28.3
Tajikistan	201	186	105	97	80.1	90.1	155	114	157.0	114.8
Tanzania	471	457	366	349	164.8	179.6	498	444	283.9	268.6
Thailand	98	201	84	86	43.5	104.4	102	86	62.4	105.6
The Comoros	128	118	113	107	43.1	44.5	143	161	65.8	86.9
Togo	<5	<5	<5	<5	0.7	0.7	<5	<5	0.7	0.8
Trinidad and Tobago	9	9	9	10	3.4	4.2	9	10	3.5	4.7
Tunisia	426	406	394	365	163.8	173.7	526	472	273.9	261.9
Turkey	956	966	861	849	469.8	518.7	1,028	1,067	652.1	778.3
Turkmenistan	267	249	193	182	113.2	122.8	225	221	150.2	168.3
Turks and Caicos Islands	5	5	<5	<5	2.3	2.5	<5	<5	2.3	2.9
USA	5,083	4,977	4,530	4,336	2,060.1	2,219.6	5,308	5,540	2,767.5	3,352.8
Uganda	97	116	66	65	43.7	53.0	76	72	57.3	63.4
Ukraine	695	674	593	602	305.0	356.5	665	801	379.3	597.2
United Arab Emirates	239,400	236,214	18,779	18,822	77,212.5	82,811.6	28,014	32,324	153,154.7	201,807.4
United Kingdom	22,130	21,864	20,307	19,560	9,486.0	10,386.9	23,741	25,707	12,694.1	16,518.5
Unknown	45,657	55,358	9,096	21,624	15,777.6	21,064.4	10,769	17,280	21,580.1	24,805.2
Uruguay	14	13	9	7	3.9	4.1	10	9	4.5	4.8
Uzbekistan	619	561	430	389	299.3	313.4	535	485	445.0	435.8
Vanuatu	<5	14	<5	5	0.8	22.0	<5	9	5.4	71.5
Venezuela	71	65	67	63	28.7	29.7	73	82	33.5	46.1
Viet Nam	19	15	19	16	7.7	7.5	20	19	8.5	8.6
Virgin Islands (U.S.)	118	118	<5	<5	38.5	41.9	<5	<5	36.6	39.7
Yemen	2,470	2,402	801	760	773.6	822.6	1,054	947	1,261.4	1,183.6
Zambia	54	51	54	51	17.0	19.9	65	71	24.1	34.3
Zimbabwe	90	86	72	72	33.0	35.8	101	89	59.2	52.7

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