Brain drain or bonanza?

The impact of Brexit on multinational banks in the UK and EU

Abstract

The 2016 UK referendum regarding continued EU membership led to the UK leaving the EU ('Brexit') in January 2020. Brexit was expected to significantly alter international trade and materially impact EU economies, especially the banking sector, as banks relocated their main trading desks, offices and employees from the UK to remaining EU countries. Numerous *ex-ante* estimates of the *potential* impact on the banking sector are based on imperfect data or fluctuating assumptions and hence vary widely. In contrast, we exploit a hand collected dataset of public country-by-country reports (CbCR) to evaluate *ex-post* changes in the geographic relocation of bank activity. Specifically, banks operating in the EU are required to publicly disclose a CbCR from 2013. We utilise this unique country-level accounting information on turnover, pre-tax profits, employee numbers, and the number of subsidiaries and branches to document changes in bank activity around key Brexit dates. Since governments may entice banks to move, we also investigate whether there are any spillover effects in adjacent EU countries. Contrary to widespread public commentary, our results reveal the UK banking sector is remarkably resilient in the wake of Brexit. Given the pivotal role of banking in the wider economy, our results should be of interest to policy makers and regulators seeking to better understand the consequences of the Brexit shocks to the European banking sector.

JEL Classification: G21, G28, H20, H25, H26, M48.

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Data availability: All data are available from the public sources identified in the paper.

1. Introduction

We examine changes to multinational banks in the United Kingdom (UK) and European Union (EU) around the 2016 decision by the UK to withdraw from the EU ('Brexit').[1] The surprising referendum result to leave the EU (52% for 'leave' compared to 48% for 'remain') created much uncertainty and was expected to have negative economic consequences for the UK. However, based on a unique hand collected dataset, we find limited support for concerns that Brexit would decimate financial services in the UK.

The referendum prompted claims the UK's financial services industry would experience significant drawbacks due to non-UK headquartered banks relocating their business out of the UK and into remaining EU countries (EU-27) to permit the ongoing service of their clients with EU-related business. The UK is widely recognised as a world leader in the financial services industry including banking, insurance, asset management, currency trading and investment management.[2] The financial and professional services industry employs over 2.5 million people in the UK with over 1.1 million in financial services, and the industry produced £278 billion of economic output in 2023 representing 12% of the UK's total economic output (City of London, 2023). Consequently, any impact on the UK's financial services sector due to Brexit may have ongoing ramifications for the broader UK economy.

Broadly, the momentous decision to leave the EU sparked claims the UK would experience significant negative economic consequences in relation to trade in goods and services, immigration, financial regulations and agriculture. In the short term, on 24 June 2016, the day following the referendum, the British Pound fell substantially against other currencies, declining by 7.8% against the US Dollar and by 5.8% against the Euro (Davies and Studnicka,

[1] Brexit is a portmanteau of the words 'British' and 'exit'.
[2] It is difficult to disentangle banking from the broader financial services industry as many banks, especially larger ones, offer many services in addition to traditional banking services such as deposit taking and lending.

2018). In the first two trading days following the referendum, global stock markets lost a record US$3 trillion in value (Bullock, 2016), while the FTSE 350[3] lost 7% of its value (Davies and Studnicka, 2018). In the longer term, estimates of Brexit costs range from €15 billion to more than €60 billion (Chang, 2018), while long-term GDP growth in the UK was estimated to reduce by 3% (Ebell and Warren, 2016; Oxford Economics, 2016; PwC, 2016a) to over 7% (Dhingra et. al., 2016). Interestingly, Johannesen et al., (2022) find the Brexit referendum triggered a sharp increase in UK property sales by offshore owners and the reduction in demand had a negative causal effect on property prices.

More specifically, widespread expectations were that considerable harm would be inflicted on the UK financial services sector (often called the 'City of London'). Estimates of the *potential* impact used a variety of techniques including general equilibrium quantitative trade models and relied on data from surveys, labour market estimates, share prices and currency fluctuations. Regarding the labour market, estimates range from 5,000 (BBC, 2018) to 100,000 (PwC, 2016b) job losses in the UK financial services sector. Moreover, Djankov (2017) estimates the UK financial sector could lose 12%-18% in revenue and 7%-8% in employment, while Sapir et al., (2017) estimate that around 17% (€1.8 trillion) of all UK banking assets may move out of the UK to where clients are located in EU-27 countries.

The wide variation in estimates made in relation to the UK banking industry in the wake of the Brexit referendum motivates our analysis. Brexit undoubtedly created uncertainty (Baker et al., 2016; Bank of England, 2019; Kim et al., 2024).[4] However, while jumping to conclusions is alluring, we argue that initial estimates were subject to four shortcomings that inhibit their accuracy and reliability. First, many forecasts were made just prior to, or shortly

[3] The FTSE350 comprises the 350 largest firms listed on the London Stock Exchange.
[4] The news-based UK economic policy uncertainty index of Baker et al., (2016) increased sharply after the referendum and far exceeded the levels it reached during the global financial crisis and Eurozone crisis.

after, the referendum in an environment shrouded in significant uncertainty where negotiations had either not yet commenced or were early stage. Similarly, estimation models were based on assumptions subject to ongoing real-time changes. Second, many estimates were based on imperfect data such as survey data which fluctuated wildly as related events and negotiations unfolded. Third, some estimates focused only on the potential shift of jobs, investment and trade *out* of the UK and neglected to consider the potential shift of activity *into* the UK because of Brexit. Fourth, significant elements of the public discourse relied on anecdotes and remain unsubstantiated while public claims made by certain banks were likely influenced by other incentives prevailing at the time, such as the desire to secure additional concessions from EU-27 countries competing to host their business post Brexit. Hence, the above deficiencies coupled with the passage of time since the referendum begs the question: *what impact, if any, did the Brexit decision have on the UK and EU banking industry*?

To appreciate Brexit's significance and its implications for future policy making, a better understanding of its real effects is required (Kanodia and Sapra, 2016), guided by inferences based on accurate and reliable data. Accordingly, our hand-collected bank-level data provides a unique opportunity to investigate whether initial estimates of an exodus of banking activity out of London to EU-27 financial centres triggered by Brexit were well-founded. Specifically, we exploit externally audited financial accounting data disclosed in public country-by-country reports (CbCR) to examine changes in key economic variables around Brexit. CbCRs are typically included within annual reports. Since 2013, in response to growing criticism of corporate tax avoidance, banks operating in the EU must publicly disclose key information (turnover, pre-tax profits, taxes, employees and subsidiaries) for every jurisdiction they operate in.[5] CbCR data provides a comprehensive picture of a bank's global activities.

[5] We use 'country' and 'jurisdiction' interchangeably, but note that some jurisdictions are not countries (e.g., Guernsey is a British Crown Dependency and Bermuda is a British Overseas Territory).

Our empirical analysis proceeds in two steps. First, the CbCR data allows us to document the geographic footprint of banks operating in the EU. This enables us to provide rich descriptive evidence on the trends across the sample period and descriptive statistics on the change in key economic variables (e.g., turnover and employees) in the UK and EU-27. We partition our sample into two primary groups based on the location of their ultimate parent – 'UK banks' (headquartered in the UK), and 'non-UK banks' (not headquartered in the UK). The latter group is decomposed into two further groups – 'EEA banks' (headquartered in the EEA), and 'Rest of World' (ROW) banks (not headquartered in the EEA).[6]

Second, using Brexit and its significant extraterritorial reach for identification, we exploit longitudinal CbCR data to identify changes in four key economic variables. Specifically, we compare the change in activity of banks who operate in the UK across time (treatment banks) to the change in activity of non-UK banks who, because of their domicile, experience no direct Brexit impact over the same period (control banks). Importantly, our approach allows us to identify and quantify a broad set of responses to Brexit being the impact on turnover, pre-tax profits, employee numbers, and the number of branches and subsidiaries (entities). Average effects documented in prior studies using macro data mask within-firm heterogeneity, whereas CbCR data permits analysis across countries, both between and within multinational banks.

Our analysis is attractive for several reasons. First, the unexpected shock of the Brexit referendum outcome is plausibly exogenous (Karpuz et al., 2025) thereby creating a quasi-natural experiment. Intense and protracted negotiations in the wake of the referendum and subsequent implementation of new regulations and agreements may have inadvertently driven banking activity out of the UK. It may also have generated ripple effects in countries not directly impacted by Brexit. Second, we hand-collected publicly disclosed CbCRs for 147

[6] The European Economic Area (EEA) includes EU countries and Iceland, Liechtenstein and Norway in the EU's single market. Switzerland is not an EU or EEA member but is part of the single market.

multinational banks operating in the EU for the 11-year period from 2013 to 2023. Thus, our sample allows a more comprehensive analysis of Brexit impacts at the individual bank-country level. Third, country-level data contained within public CbCRs is more granular than data disclosed in geographic segment reporting thereby providing a more in-depth picture of a firm's economic presence in a jurisdiction (Kang and Gray, 2019).

Based on a sample of multinational banks operating in the EU, we find that Brexit was 'the dog that did not bark'. Namely, despite extensive commentary on the potential negative effects of Brexit, our results suggest that the UK banking sector has proven to be remarkably resilient, consistent with findings in other studies (e.g., Kalaitzake, 2022). In univariate analyses, we find limited support for a significant shift of activity (i) *out* of the UK because of Brexit and (ii) *into* EU-27 countries. Our panel analysis reveals that differential reporting patterns among UK banks in the post-Brexit period become visible only when bank activity is examined at a granular, country-by-country level. When disclosed activities are aggregated across jurisdictions or considered solely at the bank headquarter country level, we find no systematic differences between UK and EEA banks. In contrast, disaggregated country-level data reveal meaningful heterogeneity in how UK banks' domestic and foreign activities evolved around Brexit. Specifically, UK banks report lower employment and a smaller number of entities, but higher profit or loss before tax, in their home country relative to EEA banks in their respective home countries and relative to foreign EEA operations. These patterns highlight the importance of country-by-country disclosures for understanding how banks reallocate reported activity across jurisdictions in the context of Brexit. Given the pivotal role of financial services in the wider economy, our results should be of interest to policy makers and regulators seeking to better understand the consequences of Brexit.

This study makes several contributions to the literature that evaluates the impact of Brexit on UK-based entities,[7] the UK economy, and financial markets more broadly.[8] To the best of our knowledge, our paper is the first to examine the direct Brexit impact on UK-headquartered banks and non-UK headquartered banks who operate in the UK. Further, our study is the first to estimate the financial impacts of Brexit by exploiting CbCR bank-country data. Our paper also contributes by demonstrating broader usefulness of CbCR data (Cordina et al., 2025). Specifically, it highlights the value of using independently audited CbCR data mandatorily disclosed to examine the impact of exogenous shocks (Brexit) to determine the extent to which home country effects or spillover effects in adjacent countries (Campello et al., 2022).

2. Background and hypothesis development

2.1. Brexit and the UK banking sector

The UK's decision to pursue a future outside of the EU was a pivotal moment in its history.[9] Appendix A provides a timeline of key events. The official 'Remain' campaign ('Britain Stronger in Europe') frequently stressed that a Brexit decision would result in dire financial consequences for the UK. Based on HM Treasury (2016, p.6) estimates, "GDP would be 6.2% lower, families would be £4,300 worse off and our tax receipts would face an annual £36 billion black hole". Yet, despite concerns, the British people decided to leave the EU, strongly influenced by "negative attitudes towards immigration, as well as effects of the perceived loss of economic sovereignty and national identities" (Clarke et al., 2017, p. 460). Arnorsson and Zoega (2018) conclude that negative attitudes towards immigration and EU

[7] See Sampson (2017), Graziano et al., (2021) and Bloom et al., (2025).
[8] Van Reenen 2016; Dhingra et al., 2017; Breinlich et al., 2018; Davies and Studnicka, 2018; Born et al., 2019; Steinberg, 2019; Hanke et al., 2020; McGrattan and Waddle, 2020; Berg et al., 2021; and Kostakis et al., 2023.
[9] The final referendum vote count revealed 17,410,742 (51.9%) of voters voted 'Leave'. In the end, 33,551,983 of the total electorate of 46,500,001 voted (72.2% turnout). See: https://www.electoralcommission.org.uk/research-reports-and-data/our-reports-and-data-past-elections-and-referendums/results-and-turnout-eu-referendum.

enlargement drove the Brexit vote. They also suggest the referendum result was a surprise given the 'Leave' campaign polling weakened to 48.3% the day before the referendum coupled with the UK being "a country known for the strength of its institutions, the tolerance of its population and an outward looking and measured foreign policy" (p.301). Further, Kellard et al., (2021) argue the result was largely unexpected since the leaders of the three largest political parties and most MPs were pro-Remain. Turbulence and political turmoil ensued.

London was the major financial hub of the EU, and the size of the financial services sector was critical to the UK economy (Djankov, 2017). Accordingly, Brexit had the potential to significantly impact UK financial services and the broader UK economy. Drawing on statistics from the City of London, Office for National Statistics, Eurostat, and TheCityUK,[10] Djankov (2017) reports that the financial services sector accounts for about 7% of UK GDP and employs around 1,060,000 people. The City of London is the UK's largest exporter and in 2015, the UK ran a £19.1 billion surplus in financial services with the EU. Financial services accounted for 25% of UK service exports to the EU and nearly one fifth of global banking activity is transacted through the UK. Based on data reported in Djankov (2017), banking is around half of UK financial services, constituting 55%, 50%, 50%, and 53% of revenues, value added, tax, and employment, respectively. While retail and business banking are primarily domestic (less than 1% of household loans relate to the EU), private banking and wealth management are primarily international (two thirds of revenues are generated by services to foreign clients). Further, around 14% of global investment banking revenue is booked through London subsidiaries of international banks. Importantly, this business relies on the EU passporting system. Based on the 2014 data in Sapir et al., (2017), total UK banking assets (retail and wholesale) amounted to €10.2 trillion, of which half relates to wholesale banking in London.

[10] TheCityUK is the industry-led body representing UK-based financial and related professional services. See: https://www.thecityuk.com/.

As a leading global financial centre, the City of London depends on the British state providing protection from external political regulation (Thompson, 2017). However, the 2008 global financial crisis and eurozone crisis in 2009-2010 left the City open to external political attack given its reputation as a beneficiary of 'light-touch regulation'. This threatened its autonomy and offshore interests. Concurrently, UK membership of the EU deteriorated, so "when David Cameron then tried to resolve the problem of EU membership through a referendum, he made it extremely difficult to defend the City's broader commercial interests in the Single European Market because freedom of movement issues weighted significantly more in British domestic politics than financial services." (Thomson, 2017, p.211).[11]

The Brexit decision set in motion a range of transformations. According to Djankov (2017, p.4), "the main difference for London-based banks before and after Brexit will be the application of regulatory standards, from data protection to capital rules". Implicitly, Brexit meant the UK could lose its passporting rights to EU member states. Under the EU passport system, a financial institution headquartered in one EU country is permitted to conduct business in other EU countries. Importantly, London is the headquarters for the European subsidiaries of many non-EU banks who use the passport system to operate branches across the EU. Relying on Capital Requirements Directive IV (CRD IV) data on 'deposit-taking institutions' and Markets in Financial Instruments Directive (MiFID) data on 'investment services and activities', Djankov (2017) reveals 102 passports for UK-based firms providing services to firms in other EU/European Economic Area (EEA) states and 2,250 outbound passports issued to UK based firms. Consequently, Brexit may lead to a migration of financial services *from* London *to* remaining EU-27 countries so that firms can seamlessly serve EU customers.

[11] Shipman (2016) offers a full account of the referendum campaign.

2.2. Country-by-country reporting

First proposed by Murphy (2003), mandatory public CbCR is designed to enhance transparency and accountability and result in reduced corporate tax avoidance via increased pressure exerted by external stakeholders. The 2008-2009 global financial crisis and ensuing austerity programs sparked widespread accusations that large multinationals, including EU banks that received taxpayer funded rescue packages, were engaging in socially unacceptable levels of tax avoidance and not paying their 'fair share' of taxes.[12] In response, guided by the objective to 'restore the trust of EU citizens in the financial services sector in the wake of the global financial crisis',[13] the EU Parliament and Council unexpectedly introduced two rules in the CRD IV[14] in February 2013,[15] including public CbCR.[16] The new rules came late in the legislative process and surprised many. CRD IV applies to (i) all EU headquartered 'financial institutions'[17] including their subsidiaries established outside the EU ('EU banks'); and (ii) financial institutions headquartered outside the EU with subsidiaries established within the EU.

[12] Tax avoidance is defined as any activity used by firms to reduce their cash tax liabilities (Hanlon and Heitzman, 2010). In practice, tax avoidance lies in the middle 'grey area' of a continuum (with legal tax planning at one end and illegal tax evasion at the other) since it conforms to the 'letter of the law' but is against the 'spirit of the law' as it usually involves the exploitation of tax law loopholes.

[13] CRD IV (Recital 52).

[14] CRD IV was the regulatory framework used to implement the Basel III reforms to improve the prudential strength of banks. It comprises (i) Directive 2013/36/EU (CRD IV) on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, and (ii) Regulation (EU) No 575/2013 (CRR) on prudential requirements for credit institutions and investment firms. CRD IV was to be transposed into domestic law by 31 December 2013, while CRR applies from the date of entry into force (17 July 2013).

[15] The European Commission commenced work on CRD IV in 2009, and Basel III was agreed by the Basel Committee on Banking Supervision during 2010-2011 and adopted in July 2013. None of the public consultations between 2009 and early 2013 contained any references to bonus caps or CbCR (Wojcik, 2015).

[16] The second rule imposed a cap on bank executives' bonuses which restricted bonuses to 100% of fixed annual salary. See: https://www.europarl.europa.eu/news/en/press-room/20130225IPR06048/meps-cap-bankers-bonuses-and-step-up-bank-capital-requirements. The UK scrapped the cap in late 2023. See: https://www.theguardian.com/business/2023/oct/24/uk-financial-regulators-scrap-cap-on-bankers-bonuses.

[17] Institutions are defined in the CRR as 'credit institutions' and 'investment firms'. Per CRR Title I Article 4.1(1), credit institutions are 'an undertaking the business of which is to receive deposits or other repayable funds from the public and to grant credits on their own account' (i.e., retail and commercial banks). Per CRR Title I Article 4.1(2) investment firms are 'any legal person whose regular occupation of business is the provision of one or more investment services to third parties and/or performance of one or more investment activities on a professional basis' as defined in Article 4(1)(1) of Directive 2004/39/EC (MiFID). These activities include order execution on behalf of clients, dealing on own account, portfolio management and investment advice.

Article 89 of CRD IV requires EU banks to *publicly* disclose the following data for each jurisdiction they operate in regardless of their size or geographic presence: (i) names(s), nature of activities and geographical location of all subsidiaries and branches (entities); (ii) turnover;[18] (iii) number of employees; (iv) profit or loss before tax; (v) tax on profit or loss; and (vi) public subsidies received. CbCRs must be published in the bank's annual report or on their website and independently audited from 2014 onwards. For fiscal year 2013, banks were only required to publicly disclose a CbCR containing turnover, employees, and entities, although Global Systemically Important Banks (G-SIBs)[19] had to privately report the remaining disclosure items to the European Commission. However, all EU banks are required to publicly disclose all disclosure items for the 2014 fiscal year onwards. Appendix B presents an example CbCR.

Interestingly, equity investors in EU banks did not react negatively to the introduction of mandatory public CbCR under CRD IV suggesting investors did not view the new disclosures as costly (Dutt et al., 2019). Brown et al., (2019) examine the information content of CbCRs and find that in the tax havens within which they operate, their sample of 70 EU banks disclose significantly higher profit margins, turnover per employee, and profit per employee, along with lower effective tax rates, relative to their non-tax haven operations. Importantly, the CbCR data disclosed by EU banks is more comprehensive than geographic data disclosed in segment reports mandated by the International Accounting Standards Board (IASB) under IFRS 8 and the Financial Accounting Standards Board (FASB) under SFAS 131 (Kang and Gray, 2019; Islam et al., 2025). Further, their mandatory nature means CbCRs differ from similar voluntary disclosures made in annual reports (Lei et al., 2023) or in ESG reports (Tsang et al., 2023).

[18] While 'turnover' is included in the formats for financial statements for non-banks as required by the Accounting Directives, it is not a commonly used term in the financial services industry. However, in line with clarifications made by the EBA in 2014, it should be understood as 'net banking income' including net interest income, net commissions and fees income, net investment income and other operating income. See: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52023DC0344.

[19] G-SIBs are discussed in more detail in Section 4.1.

2.3. Hypothesis development

Prior to and shortly after the referendum, many estimates were published on the magnitude of the potential impact of Brexit on the UK financial sector. In April 2016, PwC (2016b) published a report commissioned by TheCityUK that estimated, relative to the counterfactual of no Brexit, a reduction of 70,000-100,000 jobs and £7-12 billion in gross value added[20] in the financial services industry in 2020. In October 2016, Oliver Wyman (2016) predicted that if the UK retains passporting rights and access to the EU Single Market, revenues from EU-related activity would decline by around £2 billion and 3,000-4,000 financial services jobs would be at risk. However, if the financial services sector does not retain passporting rights, it would experience a loss of £18-20 billion in revenues and 31,000-35,000 financial services jobs. In late 2016, EY estimated 83,000 job losses over the following seven years if euro-denominated clearing moves out of London (Stafford, 2016). The EY report suggests these job losses could have a domino effect in related industries including job losses in professional legal and accounting services (18,000), wealth and asset management (15,000) and technology (12,000), ultimately reaching 232,000 job losses. Estimates of job losses moderated in 2017 and 2018. For example, EY's Brexit 'job tracker' estimated 10,500 job losses on 'day one' (Treanor, 2017). In July 2018, the City of London Corporation reduced their estimate to 5,000-13,000 jobs migrating prior to the expected exit date of March 2019 (BBC, 2018), while the Bank of England revised their estimate to 5,000 job losses (Jones, 2018).

Based on discussions with EU market participants, Sapir et al., (2017, p.2) estimate "that about 35 percent of London wholesale banking is related to EU-27-based clients, ranging from about a fifth for UK-headquartered banks to a third for US-headquartered banks and half for EU-27 headquartered banks. Thus, about €1.8 trillion (or 17 percent) of all UK banking assets

[20] Gross value added is a measure of an industry's contribution to the economy.

might be on the move as a direct consequence of Brexit". Using data from regulatory registers, media reports and other research reports, Hamre and Wright (2021) identify more than 440 UK banking and finance firms that responded to Brexit by relocating part of their business, moving staff, or establishing new entities in the EU. Hill et al., (2019) find that more internationally orientated UK firms are less affected by Brexit uncertainties consistent with geographic diversification benefits. Further, at the industry level, they find that financial companies and consumer goods and services companies are most affected by Brexit and posit two channels through which uncertainties translate to higher Brexit exposure for financial firms. First, politically induced uncertainty leads to weaker economic conditions which negatively impacts bank profitability. Second, the loss of EU passporting rights. Kellard et al., (2021) find that Brexit uncertainty negatively affected UK private equity activity during 2010-2019.

Importantly however, these early estimates "are only suggestive as negotiations are yet to start on the timing and precise shape of the EU exit" Djankov (2017, p.6). Therefore, gaining an understanding of how the potential impacts materialise in the longer term requires longitudinal analysis. In more recent analysis, Hassan et al., (2024) develop a firm-level text-based measure of the expected costs, expected benefits and exposure to the risk of Brexit. They find that international (i.e., non-UK) firms most exposed to Brexit uncertainty lost significant market value and reduced hiring and investment. Interestingly, their analysis suggests that many of Brexit's negative effects will likely materialize over the long term.

Brexit likely results in UK financial firms losing their passporting rights which creates an opportunity for other EU-27 financial centres such as Frankfurt and Paris to capitalise on Brexit (Lavery et al., 2019).[21] Indeed, several national and regional authorities in the EU proactively

[21] Indeed, from 1 January 2021, UK-based banks lost the automatic right (via passporting) to access EU/EEA market for financial services and EU banks can no longer provide services in the UK through the EU passporting system. UK banks must now operate via licences in EU member states or rely on equivalence arrangements to

helped their respective centres in luring business away from the UK (Cassis and Wojcik, 2018; Howarth and Quaglia, 2018). The European Central Bank and European Commission viewed migration (transfer of assets and staff) of financial services from the UK to the EU-27 as essential for the proper regulation and financial stability of the Single Market, and thus pressured UK-based financial services to migrate by 2022 (Donnelly, 2023). Donnelly (2023) also suggests that stock markets moved wholesale business to Amsterdam, asset management firms migrated to Luxembourg and Ireland, and banks moved to Paris, Dublin and Frankfurt. However, his conclusion is not underpinned by firm-level empirical data, but on aggregate flows based on arguments that different countries with varying taxes, regulations and guarantees of public support, naturally attract different financial services specialisations.

Contrary to estimates of a significant impact on the UK financial services sector, London's importance as a major global financial centre may lessen any Brexit-induced damage. For example, Djankov (2017) highlights the City of London's comparative advantages in addition to its history as an international financial centre since the late 17th century. Advantages include its time zone (London's trading day starts between the close of the Tokyo market and the opening of the New York market); global use of the English language (benefits London more relative to Frankfurt, Paris or Milan as Europe's main financial centre); the fair and efficient UK legal system (clear commercial laws and experienced judges); the many highly rated universities (attracts international talent and creates a pool of well-prepared professionals). Further, Djankov (2017, p.7) suggests that "because the strong interconnectedness between the financial services sector and subsectors such as accounting, auditing, legal services, management consultancy, real estate, and other professional business services can serve as a centripetal force in keeping business in the City of London, even at increased costs".

continue serving EU clients from the UK. In practice, most UK banks already had a presence in many EU member states via branches and subsidiaries (and vice versa) making the transition more manageable than anticipated.

The number of banking jobs that would move out of the UK and into the EU-27 according to Sapir et al., (2017, p.3), "depends on business considerations of the investment banks and on the 'substance requirement' of the EU supervisors. This requirement enables supervisors to demand sufficient 'substance' in the form of management, staff, and internal control systems as part of the licencing procedure". In line with Principle 5 of the Basel Core Principles of Effective Supervision (BCBS 2012), Sapir et al., (2017, p.3) suggest that "at a minimum, the new EU-27 based entities would need to have autonomous board, full senior management teams, senior account managers, and traders, although much of the back-office might stay in London or elsewhere in the world."

Some question claims that UK financial services will decline post-Brexit. Ringe (2018) cites the mutual interest of both UK and EU policymakers in preserving open financial relations to underpin his assertion Brexit will emerge as an 'irrelevance'. He posits 'creative solutions' will be developed to ensure London remains closely connected to EU markets. Leveraging the notion of 'structural interdependence' (the prospect of mutual economic harm persuades policymakers to avoid severing deep-rooted ties), Kalaitzake (2022) supports Ringe's contention by documenting how a broad range of financial contingency arrangements was developed by UK and EU policymakers when faced with a disorderly 'no-deal' Brexit in early 2019. Many of these arrangements remained in place after the UK completed its exit from the Single Market in January 2021.[22] Talani (2019) underscores the importance of London's competitive advantages to argue the City of London will prosper via a strategy of 'pragmatic adaptation', while Lysandrou et al., (2017) claim London's vast scale of liquidity relative to its EU-27 competitors means it is unlikely that relocation from London "will occur any time soon" (p. 173). This perspective is reinforced by others who contend that future equivalence

[22] While the UK formally exited the EU on 31 January 2020, it entered a transition period which ended on 31 December 2020 meaning it formally exited the Single Market on that day. The EU-UK Trade and Cooperation Agreement entered force on 1 January 2021.

decisions mitigate negative consequences (Scarpetta and Booth, 2016) and that the UK will be better off from not being a 'rule taker' of EU regulations post-Brexit (Armour, 2017).

An empirical analysis of how the City of London fared between June 2016 and May 2020 finds that Brexit did not significantly impact jobs and London has consolidated its position as the primary location for foreign direct investment, fintech funding, and attracting new firms (Kalaitzake, 2022). Although it has lost out in the handling of repurchase agreements and share trading, the City has increased its dominance in over-the-counter clearing of euro-denominated derivatives and foreign exchange. Kalaitzake (2022) contends that many early estimates were made based on *planned* rather than *actual* relocations from London and concludes (p. 610) that "London's resilience is mainly a function of its status as a crucial 'agglomeration peak' of global finance which shelters its unique ecosystem from the typical pressures of capital flight". Finally, Hall and Heneghan (2023) find that the combination of Brexit alongside the changing nature of financial work itself (retail bank branch closures, fintech, mid and back-office cost cutting) accounts for muted financial services employment growth in the UK.

Given the above discussion, whether Brexit had a significant impact on the UK banking sector remains an empirical question. Thus, we state our hypothesis in null form:

H0: *The Brexit decision did not impact activities of multinational UK and EU banks*.

3. Research design

While CbCR data provides a comprehensive snapshot of the geographic footprint of EU banks,[23] it often includes non-financial information that provides context to the quantitative disclosure items. Of relevance to our setting, some CbCRs discuss changes in their operations due to Brexit. For example, Bank of America (BoA), a US headquartered G-SIB, changed

[23] While CRD IV requires banks to disclose data for every jurisdiction they operate in, some banks aggregate the data of several countries into an 'Other' category thereby impeding precise analysis (Brown et al., 2019).

the structure of its UK and EU banking operations as a direct consequence of Brexit. One of BoA's wholly owned indirect UK subsidiaries, Bank of America Merrill Lynch International Limited (BAMLI),[24] published CbCRs for 2013 through 2017 showing it operated in eight EU countries in addition to the UK,[25] and its 2017 CbCR revealed that 83.6% (4,473) of its total employees (5,347) were located in the UK. The 2018 CbCR of another wholly owned BoA subsidiary, Bank of America Merrill Lynch International Designated Activity Company (BAMLI DAC), registered in Ireland, reveals that on 1 December 2018, BAMLI was merged into BAMLI DAC and "the merger was undertaken as part of the BoA response to the expected 2019 UK exit from EU membership". The BAMLI Annual Report for the 2017 fiscal year corroborates this by stating, "in order to ensure that it can continue to conduct business and service clients in the EU, BoA announced, in 2017, that Dublin is the preferred location for its principal EU legal entities following the UK's departure from the EU." Overall, CbCRs may help readers identify specific incidences of changes made as a direct result of Brexit in addition to any changes observable in the quantitative disclosure items.

Using the sample of UK and non-UK bank CbCRs, we adopt a multifaceted approach to investigate our research question. First, we document the geographic footprint of our sample banks and conduct univariate tests. We analyse the activity disclosed over time to determine whether the development of UK banks (e.g., Barclays) differs from non-UK banks (e.g., the Bank of China (UK) Limited whose ultimate parent is headquartered in China). Then we replicate the above analysis but narrow our focus to G-SIBs given their size and importance. Specifically, we analyse G-SIBs whose ultimate parent entities are headquartered in the EU, dividing them into UK and non-UK G-SIBs. For instance, HSBC is categorised as a UK G-

[24] According to its 2017 CbCR, its primary business activities include banking activities incorporating corporate and institutional unsecured lending, global transaction services, leasing and corporate finance services, along with support services to other group companies.
[25] The countries are Belgium, France, Germany, Ireland, Italy, Netherlands, Spain and Switzerland.

SIB, while Deutsche Bank is classified as a non-UK G-SIB. Finally, we extend the analysis by focusing on activity disclosed in the headquarter country of each G-SIB. For example, we analyse activity disclosed in the UK for HSBC and activity disclosed in Germany for Deutsche Bank. This approach enables us to investigate whether the development of UK G-SIBs in the UK differed from that of non-UK G-SIBs in their respective headquarters countries.

Second, we examine the relative changes in the four key economic variables emanating from the Brexit decision.[26] This allows for a within-country research design which offers several identification benefits. First, it reduces concerns about contemporaneous UK events that may affect UK banks. Second, it avoids cross-country heterogeneities and helps alleviate concerns about confounding events in the country in which the EU headquartered banks and non-EU headquartered banks have activities, as both groups are based in the EU. We analyse relative changes to investigate whether the development of the variables of interest disclosed in the UK varied across different periods. We partition our sample period into three phases: pre-Brexit (2014–2015), during-Brexit (2017–2019), and post-Brexit (2020–2023). We exclude 2013 due to a limited number of observations (first year of disclosure for some banks) and 2016 as it represents the referendum year. The change in each variable within a period is calculated as the difference between its value in the final and initial years of that period. For instance, the change in the pre-Brexit period (post-Brexit period) is computed as the difference between 2014 and 2015 (2020 and 2023). To ensure consistency, we only include banks with data available for all years in our sample period, minimising the risk of changes being driven by sample composition. This approach also allows each bank to serve as its own control, eliminating the need for bank fixed effects.

[26] We do not analyse taxes due to sample size issues generated by differences in tax balances disclosed in CbCRs. While CRD IV required the disclosure of 'tax on profit or loss', EU member states interpreted this differently when transposing CRD IV requirements into domestic law. That is, some member states mandate the disclosure of 'income tax expense' (income statement) while others mandate 'cash taxes paid' (cashflow statement).

Third, we employ panel regression analysis to examine the effect of Brexit on the variables of interest. We focus our analysis on banks headquartered in EEA or the UK, because these banks must publicly disclose CbCR for every country. First, we estimate a bank-year level regression model using aggregated level of disclosed activity. That is, we sum up all disclosed activities in EEA and the UK for banks in our sample. For example, if a bank discloses activities in France, Germany, and the UK, we sum up the total from these three jurisdictions. Specifically, we estimate the following bank-year level regression equation:

$$Disclosed\ Activity = \alpha + \beta_1 Referendum + \beta_2\ Brexit + \beta_3\ UKBank + \beta_{13} Referendum \times UKBank + \beta_{23} Brexit \times UKBank + \varepsilon \quad (1)$$

The dependent variable (*Disclosed Activity*) is one of the four key disclosure measures: number of employees (EMPL), number of entities (ENTY), turnover (TURN), and profit or loss before tax (PLBT). For example, $EMPL_{i,t}$ represents the aggregated number of employees disclosed by bank i in all EEA countries and the UK in year t. *Referendum* is a binary indicator equal to 1 if the year is 2016 or later, and *Brexit* is a binary indicator equal to 1 if the year is 2020 or later.[27] *UKBank* is a binary variable equal to 1 if the ultimate parent of bank i is headquartered in the UK.

Next, we estimate a bank-year level regression model using only activities disclosed in headquarter country of the bank. That is, for each bank-year observation, we only examine and include in our regression the disclosed activity of the corresponding headquarter country. For example, we examine the disclosed activity in Germany for a bank headquartered in

[27] Because Brexit occurred after the Referendum, the indicator for Brexit is nested within the Referendum dummy. Thus, β_1 captures the post-referendum but pre-Brexit effect (2016–2019), while β_2 identifies the incremental effect of Brexit itself (2020 and onwards). An interaction term between Referendum and Brexit would be perfectly collinear and is therefore omitted.

Germany (e.g. Deutsche Bank) and disclosed activity in the UK for a bank headquartered in the UK (e.g. HSBC). Specifically, we estimate the following equation:

$$Disclosed\ Activity = \alpha + \beta_1 Referendum + \beta_2\ Brexit + \beta_3\ UKBank + \beta_{13} Referendum \times UKBank + \beta_{23} Brexit \times UKBank + \varepsilon \quad (2)$$

The dependent variable (*Disclosed Activity*) is one of the four key disclosure measures: number of employees (EMPL), number of entities (ENTY), turnover (TURN), and profit or loss before tax (PLBT). For example, $EMPL_{i,t}$ represents the number of employees disclosed by bank i in its corresponding headquartered country in year t.

Lastly, we estimate a bank-country-year level regression model. That is, we include all EEA countries, and the UK disclosed level of activities for each bank for each year in our estimation model. Specifically, we estimate the following model:

$$Disclosed\ Activity = \alpha + \beta_1 Referendum + \beta_2\ Brexit + \beta_3\ UKBank + \beta_4 HQ + \beta_{13} Referendum \times UKBank + \beta_{14} Referendum \times HQ + \beta_{23} Brexit \times UKBank + \beta_{24} Brexit \times HQ + \beta_{34} UKBank \times HQ + \beta_{134} Referendum \times UKBank \times HQ + \beta_{234} Brexit \times UKBank \times HQ + \varepsilon \quad (3)$$

The dependent variable (*Disclosed Activity*) is one of the four key disclosure measures: number of employees (EMPL), number of entities (ENTY), turnover (TURN), and profit or loss before tax (PLBT). For example, $EMPL_{i,j,t}$ represents the number of employees disclosed by bank i in country j in year t. We only include EEA countries and the UK in this analysis. *HQ* is a binary indicator equal to 1 only if country *j* is bank *i*'s headquartered country. For example, *HQ* will equal to 1 if the country is Germany for Deutsche Bank and if the country is the UK for HSBC.

4. Sample selection and descriptive statistics

4.1. Sample selection

Following Brown et al., (2019), we construct a hand-collected sample of CbCRs published by multinational banks headquartered in 22 countries that operate in the EU from 2013 to 2023.[28] Our sample includes those multinational that disclose any activity in more than one country in their CbCR and thus we exclude domestic banks that do not have activities in other jurisdictions (e.g., Metro Bank and Virgin Money in the UK). The Brexit timeline commences on 22 January 2013 when Prime Minister David Cameron promised a referendum if the conservative party won the next general election, and ceases on 31 January 2020, the date the UK officially left the EU. Our 11-year sample of CbCRs therefore covers the Brexit timeline. Given the referendum date of 24 June 2016, we define the 'pre-Brexit' period as 2014-2015 (2 years), the 'during-Brexit' period as 2017-2019 (3 years), and 'post-Brexit' period as 2020-2023 (4 years).[29]

Our initial sample comprises 147 multinational banks (1,617 bank-year observations) operating within the EU and subject to the CbCR disclosure requirements. We first exclude bank-years with missing CbCR data for 2013 and 2014. Next, we eliminate banks and bank-years with cross-ownership during the observed period. Finally, we exclude banks and bank-years that do not report any activity in the UK in their CbCRs over the sample period.[30] Our total sample consists of 114 banks (1,057 bank-year observations). Almost all (99.6%) of CbCRs are independently audited by external 'Big 4' auditors. The number of observations

[28] The EU Tax Observatory maintains a similar data set with the most recent version containing data for 51 EU banks headquartered in 18 different countries between 2014 and 2020 (Barake, 2022).
[29] Despite the official Brexit date being 31 January 2020, we treat the 2020 fiscal year as being in the 'post-Brexit' period since the majority of the year (11 months) lies in the post-Brexit period and many uncertainties were resolved well before the 31 January 2020 date.
[30] We exclude bank-year observations that do not report at least one of the four variables of interest: turnover, profit or loss before tax, employee numbers, or number of entities (branches and subsidiaries).

for each empirical test varies depending on data availability. Table 1 details the sample selection procedure (Panel A) and the composition of the total sample (Panel B) and balanced panel (Panel C) split between G-SIBs and non-G-SIBs.

[Table 1]

Since 2011, the Financial Stability Board (FSB), in consultation with the Basel Committee on Banking Supervision (BCBS), annually publishes a list of 'global systemically important banks' (G-SIBs).[31] The BCBS requires certain banks to report key indicators (cross-jurisdictional activity, size, interconnectedness, financial institution infrastructure, complexity) to national supervisory authorities which are then used to calculate scores.[32] Banks above a cut-off score are identified as G-SIBs and additional requirements are applied to these banks including to maintain a higher capital buffer, total loss-absorbing capacity, resolvability and higher supervisory expectations.[33] The G-SIBs are listed in Panel B of Appendix C.[34]

Table 2 provides a breakdown of the sample distribution by year.

[Table 2]

4.2. Descriptive statistics

Our analysis focuses on four key variables: the number of employees (EMPL), the number of entities (branches and subsidiaries) (ENTY), turnover (TURN), and profit/(loss) before tax (PLBT). These variables are annually disclosed by banks for each country in which they operate. All variables are defined in Panel A of Appendix C. To standardise figures and facilitate comparisons, we convert all TURN and PLBT figures into millions of British Pounds

[31] See: https://www.fsb.org/work-of-the-fsb/market-and-institutional-resilience/global-systemically-important-financial-institutions-g-sifis/.
[32] See: https://www.bis.org/basel_framework/chapter/SCO/40.htm?inforce=20211109&published=20211109.
[33] See: https://www.fsb.org/2023/11/2023-list-of-global-systemically-important-banks-g-sibs/.
[34] Groupe BPCE (UniCredit) were classified as G-SIBs for all years except 2017 (2023). Given both banks were classified as a G-SIB for 91% of the sample period, we classify them as G-SIBs in our analysis.

(£m). For each bank-year observation, we aggregate the activity disclosed for each variable across all countries of operation. For instance, if Bank A reports employees in Denmark and the UK in 2023, we sum the employee counts for both countries. Panel A of Table 3 presents descriptive statistics for the entire sample of 114 banks, while Panel B (Panel C) provides separate statistics for G-SIBs (non-G-SIBs).

[Table 3]

The descriptive statistics reveal that the sample comprises large banks who, on average, have over 26,000 employees, 132 branches and subsidiaries, £6bn in turnover, and £1.4bn in pre-tax profits. Further, the G-SIBs are much larger than non-G-SIBs.

4.3. CbCR data characteristics

In this section, we present descriptive statistics for the development of the EU banking sector over time, highlighting the benefits of the unique public CbCR data. First, we exclude from our sample banks that do not have their ultimate parent entity headquartered either in the UK or the EU (i.e., ROW banks). We then restrict the sample to include only those banks with data available from 2014 through 2023, ensuring a balanced panel.[35] Next, to better understand the extent of the EU banking sector, we aggregate the four key variables of interest across the UK and four countries expected to benefit from Brexit: Germany, France, Ireland, and the Netherlands. For instance, Figure 1A presents the number of employees (EMPL) reported for these countries. The figure indicates a declining trend in EMPL for the UK, but no clear trend is observed for the other countries over the sample period. Specifically, the number of banking employees in our UK sample declined from approximately 320,000 in 2014 to 260,000 in 2023, a decrease of 19%. Notably, the relatively constant decrease does not change significantly at

[35] We acknowledge that using balanced samples may introduce survivorship bias. We repeat all our analysis using unbalanced samples and find qualitatively similar results (not tabulated).

key Brexit dates (e.g., 2016 or 2020). This is pattern is consistent with the contention made by Hall and Heneghan (2023) that the decline in UK financial services employment began following the 2007-08 financial crisis and Brexit merely provided an opportunity for banks to further review their businesses in light of the changing nature of the banking sector (e.g., branch closures, cost cutting, fintech).

Figure 1B presents the number of entities (ENTY) reported across the five countries. We observe a downward trend for both the UK and Germany, while France exhibits an upward trend. Specifically, the number of entities in the UK banking sector fell from approximately 2,200 in 2014 to 1,200 in 2023 (45% decrease). In contrast, the number of entities in the French banking sector increased from around 1,900 to 2,200 (16% increase). This is driven by the four French G-SIBs who collectively disclose an increase of 485 entities (34% increase).

Figures 1C and 1D illustrate the trends in reported turnover (TURN) and profit or loss before tax (PLBT) respectively for the five countries. In Figure 1C, all five countries display a modest upward trend in TURN over the sample period. In Figure 1D, all countries exhibit a pronounced decline in PLBT for fiscal year 2020 likely due to the global pandemic. The decline is most severe for the UK, where PLBT fell from approximately £10bn in 2019 to £100m in 2020, representing a 99% decrease. However, this steep decline is reversed in 2021 and 2022. The dramatic change is largely attributable to four UK banks. Specifically, HSBC reported PLBT in the UK of (£2,485m) in 2019, then (£5,595m) in 2020, followed by £3,480m in 2021. Similarly, Lloyds disclosed PLBT in the UK of £4,567m in 2019, £1,258m in 2020, followed by £6,316m in 2021. Royal Bank of Scotland reported PLBT in the UK of £3,283m in 2019, (£223m) in 2020, followed by £3,948m in 2021. Meanwhile, Standard Chartered disclosed PLBT in the UK of £671m in 2019, (£70m) in 2020, followed by £767m in 2021. Collectively, the reported PLBT of these four banks accounted for most of the decrease from 2019 to 2020 and 69% of the change from 2020 to 2021. A review of the relevant annual

reports reveals the banks attributed the 2020 results to the Covid-19 pandemic and the associated deterioration of the economic outlook including lower interest rates.

[Figure 1]

Next, to test whether the trends in Figure 1 are statistically significant, we use simple linear regressions. Each of the four variables of interest is regressed on *TREND*, defined as the year minus 2014 (e.g., 2015 = 1, 2016 = 2). Untabulated results indicate that most observed trends are significant. For instance, we find negative and significant trends in ENTY (p-value = 0.00) in all countries except France, where the trend is significantly positive (p-value = 0.00). These findings suggest the development of the four variables in the UK banking sector does not differ in direction from that experienced in Germany, France, Ireland, and the Netherlands.

Figure 2 presents heatmaps illustrating the concentration of employees across the EU banking sector in 2014 and 2023. Figure 2A displays the distribution of employees by their work location. For example, 17.4% (15.3%) of employees in the EU banking sector were based in the UK in 2014 (2023). This represents a decrease of 2.1 percentage points or 12.1%. Figure 2A also reveals an increase (decrease) in employees located in France, Italy and Spain (Germany, Ireland and the Netherlands).

[Figure 2]

Figure 2B presents the same distribution as in Figure 2A, but by the location of the bank's headquarters. Figure 2B reveals that in 2014 (2023), 16.3% (13.4%) of employees in the EU banking sector worked for banks headquartered in the UK representing a decrease of 2.9 percentage points or 17.8%. Figure 2B reveals an increase in employees by location of the bank's headquarters in France and Spain, but a decrease in Germany, Ireland and Italy. Overall, this descriptive evidence suggests that EU banks relocated employees out of the UK to other leading EU nations, especially France and Spain.

5. Results

5.1. Univariate results

In this section, we use univariate tests to investigate whether the development of the four variables of interest from 2014 – 2023. Table 4 presents the results from the univariate tests for all banks in the balanced sample (i.e. 9 UK banks and 65 non-UK banks). Panel A reveals changes in the number of employees disclosed in the UK. For example, in 2015, the average number of employees in the UK compared to 2014 decreased by 860 for UK banks and increased by 145 for non-UK banks. Over the entire sample period, the average number of employees disclosed in the UK declined by 798 for UK banks and increased by 1 for non-UK banks. The decrease for the UK banks is statistically significant (p-value = 0.00) while the increase for non-UK banks is not statistically significant (p-value = 0.96). However, the relative changes between these two groups of banks is statistically significant in every year and overall (p-value = 0.00). While the annual decrease in the number of employees employed in the UK by UK banks (except between 2022 and 2023) are mainly statistically insignificant (the decrease between 2020 and 2021 is significant at the 5% level, p-value=0.03), the overall decrease between 2014 and 2023 is significant (p-value = 0.00). Conversely, the annual changes in UK employees for non-UK banks are largely not statistically significant (the change between 2020 and 2021 and 2022 to 2023 are mildly significant) and the overall change between 2014 and 2023 is not significant. This suggests the decrease in employees employed in the UK is driven by UK banks and not non-UK Banks.

[Table 4]

Panels B through D extend this analysis to examine annual changes in the number of entities, turnover, and profit or loss before tax disclosed in the UK, respectively. We find that the differences in changes between UK and non-UK banks is statistically significant only for

entities. These findings suggest that UK and Non-UK banks experienced differing trajectories in their UK operations during the sample period in terms of employees and entities, but not turnover or profit/(loss) before tax.

5.2. Relative changes results

Table 5 summarise our results for the analysis of the relative changes. Table 5 compares changes between the pre-Brexit and post-Brexit periods (for 9 UK banks and 65 non-UK banks). Panel A examines changes in the disclosed number of employees in the UK. The change in the number of employees during the pre-Brexit period is (860) for UK banks and 145 for non-UK banks. The change in number of employees during the post-Brexit period is (1,298) for UK banks and (26) for non-UK banks. This corresponds to a difference of (438) and (171) between the two periods for UK and non-UK banks, respectively. However, these differences are not statistically significant. Panels B through D analyse changes in the number of entities, turnover, and profit or loss before tax disclosed in the UK, respectively. We only find a statistically significant difference of £2,784m between the two periods for profit/(loss) before tax for UK Banks (p-value = 0.02).

[Table 5]

Overall, we find limited evidence that changes within the pre-Brexit period differ from post-Brexit period. In untabulated analysis, we compare the pre-Brexit and the post-Brexit period and fail to find a statistically significant difference.

5.3. Regression results

For our regression analysis, we focus on the subsample of 9 UK banks and 41 banks that are headquartered in the EEA (i.e. EEA banks). The results when estimating Equations (1) and (2) are untabulated to conserve space. In relation to Equation (1), the coefficients for

$Referendum \times UKBank$ and $Brexit \times UKBank$ are statistically insignificant across all four key disclosure measures. That is, we fail to find evidence for any difference in the development of UK and EEA banks post referendum or post Brexit.[36] In relation to Equation (2), the coefficients for $Referendum \times UKBank$ and $Brexit \times UKBank$ are statistically insignificant across all four key disclosure measures. That is, we fail to find evidence for any difference in the development of UK and EEA banks post referendum or post Brexit.

[Table 6]

Table 6 presents the results from the multi-variate regression analysis. In column (a3), the coefficient on $Referendum \times UKBank \times HQ$ is negative and statistically significant. This indicates that following the referendum, UK banks reduced employment in their home country (i.e. UK) by approximately 3,104 employees more than EEA banks did in their respective home countries, relative to foreign EEA operations. The coefficient on $Brexit \times UKBank \times HQ$ is also negative and statistically significant. This suggests that following Brexit, UK banks experienced an *additional* reduction of approximately 2,103 employees in their home country relative to EEA banks' home country employment, again relative to foreign EEA operations. Because the Brexit indicator is nested within the referendum period (i.e., the referendum indicator equals one whenever the Brexit indicator equals one), the Brexit triple interaction captures the incremental effect beyond the post-referendum period.

In column (b3), we find qualitatively similar results when the disclosed activity is the number of entities. In contrast, we find no evidence of differential developments between UK and EEA banks for turnover. For profit or loss before tax, we find a statistically significant effect only following Brexit. Specifically, the coefficient on $Brexit \times UKBank \times HQ$ is

[36] We re-estimate our model using consolidated level for all jurisdictions (i.e., non-EEA jurisdictions) and find qualitatively similar results.

positive and statistically significant, indicating that following Brexit, UK banks reported approximately £660 million higher profit or loss before tax in their home country relative to EEA banks' respective home country profits, and relative to foreign EEA operations.

Overall, the results indicate that UK banks exhibited differential patterns in certain dimensions of their domestic activities relative to EEA banks and relative to foreign EEA operations during the Brexit period, while other dimensions remained unaffected. We find consistent evidence of relative reductions in domestic employment and the number of entities for UK banks in the post-Brexit periods, but no corresponding differential patterns for turnover. In contrast, for profit or loss before tax, we observe UK banks reporting higher domestic profitability relative to EEA banks and relative to foreign EEA operations. Taken together, these findings are consistent with a reallocation in the composition of UK banks' domestic disclosed footprint over the Brexit period, characterised by a contraction in physical presence alongside a relative increase in reported profitability at home.

The absence of statistically significant effects in the aggregated bank-year specifications and the HQ-only regressions contrasts with the results from the bank-country-year analysis. This difference reflects the fact that aggregation across jurisdictions, or restricting attention to headquarter-country activity alone, may mask cross-country heterogeneity in banks' responses to Brexit. Specifically, reductions in domestic activity may be offset by increases in foreign operations, or vice versa, resulting in null effects at the aggregated level. By exploiting country-level variation in disclosed activity, the bank-country-year specification permits us to net out these offsetting movements and identify differential post-referendum and post-Brexit adjustments across home and foreign EEA jurisdictions.

6. Additional analysis

6.1 Analysis of GSIBs and non-GSIBs

The main analysis includes both G-SIBs and non-G-SIBs. However, the impact of Brexit on their banking activities may differ due to characteristics that distinguish the two groups. For instance, G-SIBs are considerably larger in terms of employees, turnover, and other metrics (see Table 3). This suggests the resources available to counter potential Brexit effects may vary. In addition, non-UK banks include ROW banks, which we exclude in the following subsections as we also aim to analyze developments in the headquarter country. Accordingly, we examine G-SIBs and non-G-SIBs separately.

6.1.1. Banking activity disclosed in the UK (UK and EEA Non-G-SIBs)

Table 7 presents the results from the univariate tests for UK Non-G-SIBs and EEA Non-G-SIBs (non-G-SIBs with ultimate parent headquartered in the EEA). Panel A illustrates changes in the number of employees disclosed in the UK. For example, in 2015, the average number of employees disclosed in the UK decreased by 1,207 for UK Non-G-SIBs and increased by 227 for EEA Non-G-SIBs, compared to 2014. Over the full sample period, the average number of employees disclosed in the UK decreased by 934 for UK Non-G-SIBs, but increased by 14 for EEA Non-G-SIBs. The difference in these changes is statistically significant (p-value = 0.00).

[Table 7]

Panels B through D of Table 7 extend the analysis to examine annual changes in the number of entities, turnover, and profit or loss before tax disclosed in the UK, respectively. We find that the differences in changes between UK Non-G-SIBs and EEA Non-G-SIBs banks are statistically significant for all variables of interest. These findings suggest that UK and EEA Non-G-SIBs banks experienced differing trajectories in their UK operations during the sample period. However, the difference in trajectories is only in terms of magnitude not direction (except for number of employees).

6.1.2. Banking activity disclosed in the headquarter country (UK and EEA Non-G-SIBs)

Table 8 presents the results from the univariate tests for the same banks in section 5.1 but for activities disclosed in the bank's headquarter country. For example, we compare number of employees disclosed in the UK for UK Non-G-SIBs with number of employees disclosed in Germany for Non-G-SIBs headquartered in Germany. Panel A illustrates changes in the number of employees. For example, in 2015, the average decline in the number of employees disclosed in the headquarter country was 1,207 for UK Non-G-SIBs and 121 for EEA Non-G-SIBs, compared to 2014. Over the full sample period, the average number of employees disclosed in the headquarter country decreased by 934 for UK (144 for EEA) Non-G-SIBs. The difference in these changes is statistically significant (*p*-value = 0.00).

[Table 8]

Panels B through D of Table 8 extend the analysis to examine annual changes in the number of entities, turnover, and profit/(loss) before tax disclosed in the headquarter country, respectively. We find that the differences in changes between UK Non-G-SIBs and EEA Non-G-SIBs banks is statistically significant only for number of entities. These findings suggest that UK and EEA Non-G-SIBs banks experienced differing trajectories in the development of their headquarter operations during the sample period in terms of number of employees and entities, but not turnover of profit/(loss) before tax. However, the difference in trajectories is only in terms of magnitude not direction.

6.1.3. Banking activity disclosed in the UK (G-SIBs)

Table 9 summarises the results for banking activity disclosed in the UK by G-SIBs. Panel A examines changes in the number of employees disclosed in the UK. For example, in 2015, the average number of employees disclosed in the UK decreased by 167 for UK G-SIBs, but

increased by 158 for non-UK G-SIBs, compared to 2014. Over the full sample period, the average number of employees disclosed in the UK declined by 527 for UK G-SIBs (18 for non-UK G-SIBs). The difference in these changes is statistically significant (*p*-value = 0.01).

[Table 9]

Panels B through D of Table 9 extend the analysis to assess changes in the number of entities, turnover, and profit/(loss) before tax disclosed in the UK, respectively. The relative changes between the two groups are statistically significant for the number of entities (*p*-value = 0.00) but not for turnover (*p*-value = 0.77) or profit/(loss) before tax (*p*-value = 0.82). We find that the differences in changes between UK G-SIBs and EEA G-SIBs is statistically significant only for entities. These findings suggest that UK G-SIBs and EEA G-SIBs experienced differing trajectories in their UK operations during the sample period in terms of employees and entities, but not turnover or profit/(loss) before tax.

6.1.4. Banking activity disclosed in the headquarter country (G-SIBs)

Table 10 presents the results for G-SIBs in relation to activity disclosed in their headquarter country. In Panel A, we analyse changes in the number of employees disclosed in the headquarter country. For instance, in 2015, the average number of employees decreased by 167 for UK (245 for non-UK) G-SIBs, compared to 2014. Over the entire sample period, the number of employees disclosed in the headquarter country decreased by 527 for UK G-SIBs and 228 for non-UK G-SIBs. The difference in these changes is statistically insignificant (*p*-value = 0.43).

[Table 10]

Panels B through D of Table 10 examine changes in the number of entities, turnover, and profit/(loss) before tax disclosed in the headquarter country of each G-SIB, respectively. The

differences in changes between the two groups are statistically insignificant for all three measures: number of entities (p-value = 0.15), turnover (p-value = 0.89), and profit or loss before tax (p-value = 0.95). Overall, we find no evidence that UK G-SIBs and non-UK G-SIBs developed differently in their respective headquarters countries during the sample period.

To summarize, the univariate analysis in this section indicates little difference in the trajectories of UK or home-country banking activities between UK and EEA banks, for both G-SIBs and non-G-SIBs. The only finding consistent with a potential Brexit effect is the decline in the number of employees and entities among UK banks. However, this trend is unlikely to be driven by Brexit as it began in 2014. Moreover, a similar pattern is observed in the headquarter countries of EEA banks, suggesting that the decline reflects a broader trend in the EU banking sector rather than a Brexit-specific effect.

6.2 Internationalization of bank activities

We conduct additional analysis to supplement our previous analysis and demonstrate the strength of the granular CbCR data in analysing multinational banks. Specifically, our CbCR sample also enables us to compute statistics related to the internationalization of bank activities for our sample banks. For example, the internationalization of a UK bank in terms of employees can be calculated by aggregating the number of employees reported in jurisdictions outside the UK and dividing this by the total number of employees reported across all jurisdictions.[37] More generally, the internationalization of bank activity (in terms of EMPL, ENTY, TURN or PLBT) can be calculated by the following formula:

$$Internationalization = 1 - \frac{Activity\ disclosed\ for\ headquarter\ country}{Total\ activity\ disclosed}$$

[37] Since EEA and UK banks are required to disclose activities in all jurisdictions where they operate, the aggregation across jurisdictions should reconcile to the bank-level totals.

We continue to focus on UK banks and EEA banks since their CbCRs disclose the full global activity of these banks. In contrast, we only have the CbCRs for the UK operations of ROW banks (i.e., we cannot observe the full global country-by-country activity of these banks). Table 11 presents our results. In Panel A, we report the internationalization of bank activities in terms of the number of employees. On average, UK banks report approximately 33% of their employees in jurisdictions outside the UK, while the corresponding figure for non-UK banks is around 35%. This difference is marginally significant (*p*-value = 0.09). In Panels B through D, we repeat the analysis for internationalization measured by ENTY, TURN, and PLBT, respectively. We do not find statistically significant differences in internationalization rates between UK and non-UK banks across these three dimensions.

[Table 11]

7. Conclusion

Financial services companies, including banks, compete domestically and abroad, across borders within Europe and beyond. We provide new evidence on the impact of an arguably exogenous shock on this sector. Specifically, we exploit country-by-country reporting (CbCR) data mandatorily disclosed by banks operating in the EU to document the unintended consequences of the Brexit referendum in 2016 and the UK's subsequent departure from the EU in early 2020. CbCR data helps illuminate the global activities of multinational banks and therefore provides us with a clear advantage over other geographic information (e.g., geographic segment reporting under International Financial Reporting Standard 8 *Operating Segments*). We focus on the historic and unexpected decision by the UK voters to leave the EU that triggered claims many banks would move employees and business out of the UK and into EU countries to continue servicing their EU clients. Notwithstanding these anecdotal claims, limited empirical evidence exists to support these anticipated real effects. Using public

CbCR data, we document the real effects (if any) of EU referendum and Brexit, including the migration of highly specialised, skilled and well-remunerated banking employees in financial services, along with the associated relocation of turnover, profits, and corporate entities (branches and subsidiaries).

This study has several limitations. First, the relatively small sample size means empirical tests may lack statistical power and results may not be generalizable to larger populations or to other industries. Nonetheless, this study informs the ongoing debate regarding the impact of Brexit. Second, our paper examines changes up to and including the 2023 fiscal year. However, the impact of Brexit may take many years to unfold (Hall and Heneghan, 2023; Hassan et al., 2024), so future research could examine the longer-term impacts of Brexit by using a longer post-Brexit time period.

Lastly, our paper focuses on how financial institutions and banks are affected by Brexit. However, non-banks are also likely affected by Brexit. Future research may use non-banks' segment data, or even CbCR data provided voluntarily by some non-banks, to document short-term and long-term firm-country level consequences of Brexit. Further, CbCR prepared by EU banks in accordance with CRD IV also contains information regarding public subsidies' banks received from each country in which they operate. Prior research documents that subsidies affect income shifting (Pappas et al., 2024). Future research might therefore use CbCR data to investigate the unintended consequences of government subsidies extended to EU and UK banks during Brexit and the Covid-19 pandemic.

Appendix A: Brexit timeline

Period	Year	Month/Date	Event
Pre-Brexit	2013	January	UK Prime Minister David Cameron announces plan to hold an EU referendum
	2015	May	Conservative Party wins general election, committing to an EU referendum
During-Brexit	2016	June 23	UK referendum: 52% vote to leave the EU
	2016	June 24	David Cameron resigns as Prime Minister
	2016	July	Theresa May becomes Prime Minister
	2017	March 29	UK formally triggers Article 50, beginning withdrawal process
	2018	November	Draft Withdrawal Agreement agreed with EU
Post-Brexit	2020	January 31	UK legally left the EU but still part of the EU single market
	2020	December 31	UK left the EU single market

Appendix B: Example CbCR

The CbCR presented below is taken from the 2021 CbCR of HSBC.

Country–by–Country Reporting (continued)

	Year ended 31 December 2021			
	Turnover US$m	Average FTEs[9]	Profit/(loss) before tax[1] US$m	Corporation tax paid/ (refunded)[8] US$m
Middle East and Africa				
United Arab Emirates	1,052	2,743	315	47
- of which: impairment of subsidiaries	*(120)*		*(120)*	
Egypt	534	2,768	283	82
Turkey	296	1,941	138	28
Saudi Arabia	190	285	370	14
- of which: Associates and JVs [4]			*276*	
Qatar	177	275	120	7
Oman	176	752	55	1
South Africa	104	162	63	15
Bahrain	84	194	45	–
Kuwait	44	65	29	–
Israel	34	80	7	3
Algeria	33	110	23	8
Lebanon	1	3	–	–
North America				
United States	5,808	7,701	754	8
Canada	1,924	4,986	768	222
Bermuda[5]	235	393	96	–
Cayman Islands[5]	1	2	(5)	–
British Virgin Islands[5]	1	–	12	–
Latin America				
Mexico	2,460	15,670	483	71
- of which: impairment of goodwill	–		*(110)*	
Argentina	628	3,326	98	20
Uruguay	66	246	16	–
Brazil	51	138	5	6
Chile	38	79	23	3
Group Accounting Adjustments[6]				
Intra-HSBC transactions eliminated on consolidation	(21,836)		–	–
Reversal of impairments of goodwill	–		(477)	–
Elimination of impairments of investments in subsidiaries	(2,828)		(2,828)	–
Other[7]	(87)		580	–
Total	**49,552**	**223,042**	**18,906**	**2,740**

1 A geographical analysis of profit before tax is provided on page 114 of the HSBC Holdings plc Annual Report and Accounts 2021. That analysis by country is different from the table above, which is based on country of tax residence.
2 The UK profit/(loss) before tax includes $4,785m for HSBC UK Bank plc, $269m for HSBC Bank plc and $(913)m for HSBC Holdings plc. The amount for HSBC Holdings plc includes $3,065m for the reversal of impairments of investments in subsidiaries, which are offset in the Group Accounting Adjustments section of this report. As a result of timing differences, some impairments of investments in subsidiaries are recorded in entities' solus financial statements in a different period from that in which they are reflected for Country-by-Country Reporting.
3 Hong Kong Special Administrative Region of the People's Republic of China.
4 Share of profit from associates and JVs. The Saudi British Bank and Bank of Communications Co., Ltd are reported after tax.
5 Local statutory tax rate is 0%.
6 Accounting adjustments arising on group consolidation and not included in the results of any jurisdiction.
7 This mainly relates to differences in hedging designations between consolidated and subsidiary level and elimination of fair value gains on holdings of intra-group securities.
8 The cash flow statement contained within the HSBC Holdings plc Annual Report and Accounts 2021 shows tax paid of $3,077m. That figure also includes withholding taxes paid.
9 FTEs as at 31 December 2021 as reported on page 29 of the HSBC Holdings plc Annual Report and Accounts 2021 was 219,697. The FTEs figure above was the average for the year.

Appendix B: Example CbCR (continued)

The CbCR presented below is taken from the 2021 CbCR of HSBC.

The main subsidiaries of HSBC Holdings plc, their main business activities and their country of operation as at 31 December 2021 are as follows:

Main subsidiary	Country	Nature of activities[1]
Europe		
HSBC Bank plc	United Kingdom	GB&M
HSBC UK Bank plc	United Kingdom	WPB, CMB
HSBC Continental Europe	France	WPB, CMB, GB&M
HSBC Trinkaus & Burkhardt AG	Germany	WPB,CMB, GB&M
Asia		
Hang Seng Bank Limited	Hong Kong	WPB, CMB, GB&M
HSBC Bank (China) Company Limited	China	WPB, CMB, GB&M
HSBC Bank Malaysia Berhad	Malaysia	WPB, CMB, GB&M
HSBC Life (International) Limited	Hong Kong[2]	WPB, CMB
The Hongkong and Shanghai Banking Corporation Limited	Hong Kong	WPB, CMB, GB&M
Middle East and North Africa		
HSBC Bank Middle East Limited	United Arab Emirates	WPB, CMB, GB&M
North America		
HSBC Bank Canada	Canada	WPB, CMB, GB&M
HSBC Bank USA, N.A.	USA	WPB, CMB, GB&M
Latin America		
HSBC Mexico, S.A., Institución de Banca Múltiple, Grupo Financiero HSBC	Mexico	WPB, CMB, GB&M

1 *HSBC's four principal global businesses are Wealth Management and Private Banking ('WPB'), Commercial Banking ('CMB'), Global Banking and Markets ('GB&M') and Corporate Centre. Refer to pages 30-36 of the* HSBC Holdings plc Annual Report and Accounts 2021 *for descriptions of the global businesses.*

2 *HSBC Life (International) Limited is resident in Hong Kong for tax purposes. Bermuda is the company's place of incorporation.*

Details of all HSBC subsidiaries, as required under Section 409 of the Companies Act 2006, are set out on pages 388–393 of the *HSBC Holdings plc Annual Report and Accounts 2021*.

5 The Capital Requirements (Country-by-Country Reporting) Regulations 2013

Appendix C: Variable definitions and G-SIB list

Panel A: Variable definitions

Variable name	Mnemonic	Definition
Turnover	TURN	Turnover disclosed in the CbCR of bank *i* in country *j* in year *t.*
Profit/(loss) before tax	PLBT	Profit/(loss) before tax disclosed in the CbCR of bank *i* in country *j* in year *t.*
Number of employees	EMPL	Number of employees disclosed in the CbCR of bank *i* in country *j* in year *t.*
Number of entities (subsidiaries and branches)	ENTY	Number of entities disclosed in the CbCR of bank *i* in country *j* in year *t.*

Panel B: Global Systemically Important Banks (G-SIBs) as of 2014

Bank	**HQ country**	**Bank**	**HQ country**
Barclays	UK	Sumitomo Mitsui FG	Japan
HSBC	UK	ING Bank	Netherlands
Royal Bank of Scotland	UK(1)	BBVA	Spain(4)
Standard Chartered	UK	Santander	Spain
Agricultural Bank of China	China	Nordea	Sweden(5)
Bank of China	China	Credit Suisse	Switzerland
Industrial and Commercial Bank	China	UBS	Switzerland
BNP Paribas	France	Bank of America	USA
Group Credit Agricole	France	Bank of New York Mellon	USA
Groupe BPCE	France(2)	Citigroup	USA
Societe Generale	France	Goldman Sachs	USA
Deutsche Bank	Germany	JP Morgan Chase	USA
UniCredit Group	Italy(3)	Morgan Stanley	USA
Mitsubishi UFJ FG	Japan	State Street	USA
Mizuho FG	Japan	Wells Fargo	USA

(1) Classified as a G-SIB up to 2017.

(2) Classified as a G-SIB for all years except 2017.

(3) Classified as a G-SIB for all years except 2023.

(4) Classified as a G-SIB up to 2015.

(5) Sweden to September 2017 and Finland thereafter. Classified as a G-SIB up to 2017.

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Figure 1 – Activity reported in selected countries across the sample period

Figure 1A

Figure 1B

Figure 1C

Figure 1D

Figure 2 – Employees reported in selected countries (regardless of bank HQ)

Figure 2A

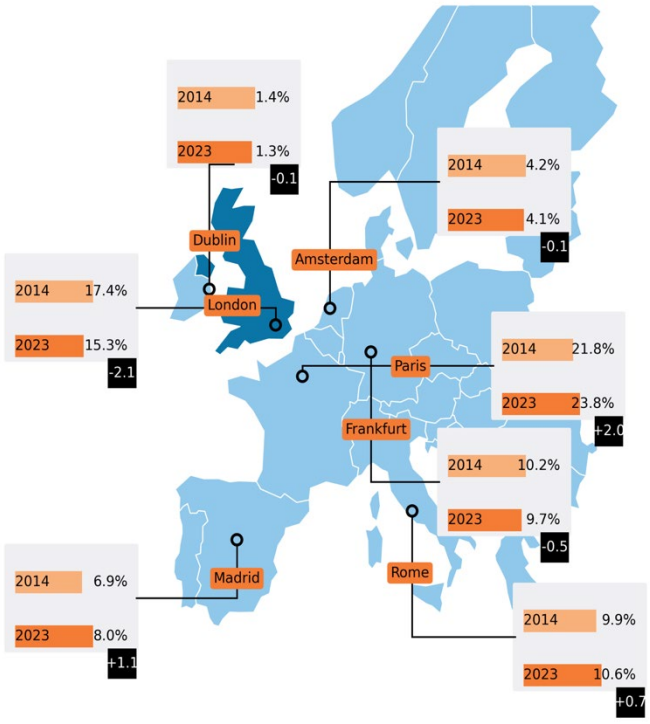

Figure 2B

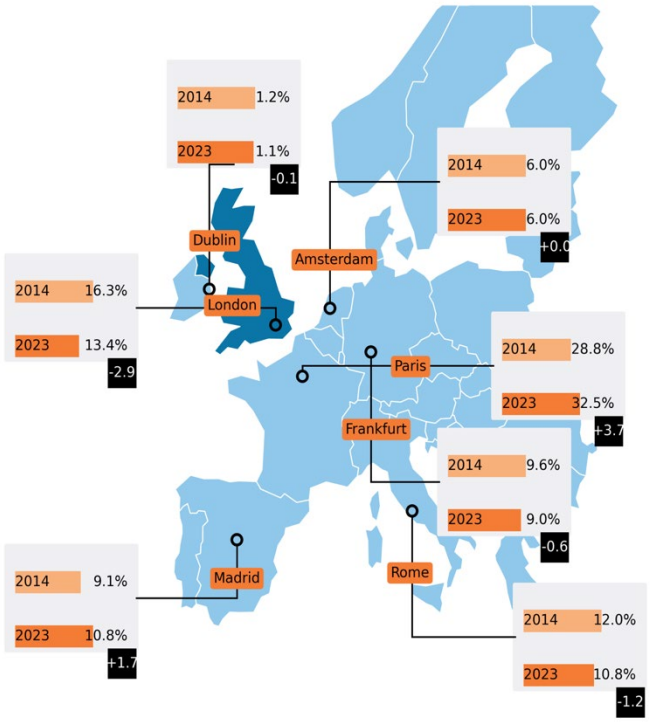

Table 1: Sample selection

Table 1 outlines the sample selection criteria. The number of observations for each empirical test varies depending on the availability of data.

Panel A: Sample selection criteria

Selection criteria	Banks	Bank-years
Banks operating in the EU from master CbCR sample maintained by corresponding author	147	1,617
Less: Bank-years for which no 2013 CbCR could be found (first year of disclosure)	-	(12)
Less: Bank-years for which no 2014 CbCR could be found (possible non-compliance)	-	(13)
Less: Bank with cross-ownership during the period	(2)	(160)
Less: Bank that do not disclose any activity in the UK in their CbCR during the sample period	(31)	(375)
Total sample	**114**	**1,057**

Panel B: Total sample

	G-SIBs		Non-G-SIBs		Total	
	Banks	Bank-years	Banks	Bank-years	Banks	Bank-years
UK banks	4	38	8	90	12	128
Non-UK banks	10	96	92	833	102	929
EEA banks	*10*	*96*	*52*	*476*	*62*	*572*
ROW banks	*0*	*0*	*40*	*357*	*40*	*357*
	14	**134**	**100**	**923**	**114**	**1,057**

Panel C: Balanced sample

	G-SIBs		Non-G-SIBs		Total	
	Banks	Bank-years	Banks	Bank-years	Banks	Bank-years
UK banks	3	30	6	60	9	90
Non-UK banks	8	80	57	570	65	650
EEA banks	*8*	*80*	*33*	*330*	*41*	*410*
ROW banks	*0*	*0*	*24*	*240*	*24*	*240*
	11	**110**	**63**	**630**	**74**	**740**

Table 2: Sample distribution by year

Table 2 illustrates the distribution of CbCRs by year.

Sample distribution

Year	Total sample		Balanced sample	
	Obs.	%	Obs.	%
2013	83	8%	-	-
2014	90	9%	74	10%
2015	102	10%	74	10%
2016	100	10%	74	10%
2017	101	10%	74	10%
2018	99	9%	74	10%
2019	102	10%	74	10%
2020	98	9%	74	10%
2021	95	9%	74	10%
2022	94	8%	74	10%
2023	93	8%	74	10%
All Years	**1,057**	**100%**	**740**	**100%**

Table 3: Descriptive Statistics

Table 3 presents the descriptive statistics for the 114 sample banks. EMPL represents the number of employees; ENTY denotes the number of entities (subsidiaries and branches); TURN is the turnover, and PLBT refers to profit or loss before tax. TURN and PLBT are converted into millions of British pounds to facilitate comparison. We aggregate all variables across countries within each bank-year observation. For instance, if a bank reports employee numbers in both Denmark and the United Kingdom, EMPL for that observation is the sum of employees in both countries. Panel A displays the overall descriptive statistics for the entire sample of banks. Panel B (Panel C) reports descriptive statistics for the sample separated by G-SIBs (non-G-SIBs).

Panel A: All Banks (n = 1,057)

Variable	Mean	Median	Minimum	Maximum
EMPL	26,008	3,859	1	258,954
ENTY	132	28	1	1,383
TURN (£m)	6,071	1,508	(1,589)	65,329
PLBT (£m)	1,444	226	(8,822)	19,483

Panel B: G-SIBs (n = 134)

Variable	Mean	Median	Minimum	Maximum
EMPL	123,779	107,633	29,483	258,954
ENTY	600	658	33	1,383
TURN (£m)	25,894	22,091	7,969	65,329
PLBT (£m)	5,954	5,176	(8,822)	19,483

Panel C: Non-G-SIBs (n = 923)

Variable	Mean	Median	Minimum	Maximum
EMPL	11,271	2,560	1	134,776
ENTY	63	20	1	874
TURN (£m)	3,149	958	(1,589)	43,317
PLBT (£m)	791	147	(5,970)	13,914

Table 4: Activity Disclosed in the UK by All Banks

Table 4 presents the activity disclosed in the UK for our sample banks. A bank is classified as a UK bank if its ultimate parent is headquartered in the UK, and as a non-UK bank if its ultimate parent is headquartered outside the UK. All variables of interest are defined according to the activity disclosed in the UK. For example, EMPL is defined as the number of employees disclosed in the UK. Panel A of Appendix C provides a summary of the variables of interest. In Panels A through D, column 3 (7) shows the average values of the variable of interest for UK (Non-UK) banks. Columns 4 and 8 report the average changes from the previous year for UK and Non-UK banks, respectively. Columns 5 and 9 provide the *p*-values from a Student's t-test to assess whether the changes are significantly different from zero. The final column presents the *p*-value from a Student's t-test comparing whether the relative changes (RC) between UK and Non-UK banks is statistically significant.

Panel A: Number of Employees Disclosed in the UK

	UK Banks				Non-UK Banks				RC
Year	Obs.	EMPL	Change	*p*-value	Obs.	EMPL	Change	*p*-value	*p*-value
2014	9	29,928			65	1,310			
2015	9	29,068	(860)	0.30	65	1,455	145	0.21	**0.02**
2016	9	27,298	(1,770)	0.14	65	1,422	(33)	0.21	**0.00**
2017	9	25,924	(1,374)	0.19	65	1,415	(7)	0.87	**0.00**
2018	9	25,157	(767)	0.30	65	1,406	(9)	0.70	**0.00**
2019	9	24,643	(514)	0.26	65	1,392	(14)	0.80	**0.02**
2020	9	24,042	(602)	0.11	65	1,344	(48)	0.22	**0.00**
2021	9	22,787	(1,255)	**0.03**	65	1,274	(70)	**0.10**	**0.00**
2022	9	22,077	(710)	0.14	65	1,272	(2)	0.91	**0.00**
2023	9	22,743	666	0.13	65	1,318	47	**0.07**	**0.00**
All Years	90	25,367	(798)	**0.00**	650	1,361	1	0.96	**0.00**

Panel B: Number of Entities Disclosed in the UK

	UK Banks				Non-UK Banks				RC
Year	Obs.	ENTY	Change	*p*-value	Obs.	ENTY	Change	*p*-value	*p*-value
2014	9	171			65	12			
2015	9	157	(14)	0.15	65	12	(1)	0.24	**0.00**
2016	9	144	(13)	0.12	65	11	(1)	0.18	**0.00**
2017	9	130	(14)	**0.07**	65	11	(0)	0.33	**0.00**
2018	9	121	(9)	0.12	65	10	(1)	**0.08**	**0.00**
2019	9	107	(14)	0.14	65	9	(1)	**0.05**	**0.00**
2020	9	101	(6)	0.12	65	9	(1)	**0.03**	**0.00**
2021	9	93	(8)	**0.07**	65	9	(0)	**0.10**	**0.00**
2022	9	96	3	0.18	65	8	(1)	**0.01**	**0.00**
2023	9	91	(5)	0.17	65	8	(0)	0.65	**0.00**
All Years	90	121	(9)	**0.00**	650	10	(0)	**0.00**	**0.00**

Panel C: Turnover (in £m) Disclosed in the UK

	UK Banks				Non-UK Banks				RC
Year	Obs.	TURN	Change	*p*-value	Obs.	TURN	Change	*p*-value	*p*-value
2014	9	6,521			65	587			
2015	9	6,707	187	0.42	65	632	44	0.37	0.36
2016	9	6,927	219	0.44	65	717	85	**0.00**	0.27
2017	9	7,045	118	0.74	65	726	10	0.60	0.41
2018	9	7,376	331	0.40	65	787	60	0.11	0.11
2019	9	7,560	184	0.36	65	737	(49)	0.21	**0.07**
2020	9	6,508	(1,052)	**0.08**	65	786	49	0.13	**0.00**
2021	9	7,340	832	0.11	65	765	(22)	0.73	**0.00**
2022	9	8,361	1,021	**0.04**	65	950	185	**0.01**	**0.00**
2023	9	7,622	(739)	0.52	65	936	(13)	0.67	**0.07**
All Years	90	7,197	122	0.48	650	762	39	**0.01**	0.27

Panel D: Profit/(Loss) Before Tax (in £m) Disclosed in the UK

	UK Banks				Non-UK Banks				RC
Year	Obs.	PLBT	Change	*p*-value	Obs.	PLBT	Change	*p*-value	*p*-value
2014	9	787			65	71			
2015	9	272	(516)	0.11	65	104	33	0.28	**0.00**
2016	9	515	243	0.63	65	158	54	**0.02**	0.30
2017	9	953	438	0.55	65	174	16	0.40	0.10
2018	9	1,504	551	0.17	65	182	7	0.73	**0.00**
2019	9	901	(603)	0.12	65	127	(55)	**0.08**	**0.00**
2020	9	(237)	(1,138)	**0.07**	65	158	31	0.37	**0.00**
2021	9	2,436	2,673	**0.03**	65	143	(15)	0.84	**0.00**
2022	9	2,659	223	0.33	65	302	160	**0.02**	0.74
2023	9	2,031	(628)	0.47	65	292	(10)	0.73	**0.05**
All Years	90	1,182	138	0.53	650	171	25	**0.07**	0.20

Table 5: Difference-in-Differences (Pre-Brexit and Post Brexit)

Table 5 presents our results for the difference-in-differences (DiD) analysis. A bank is classified as a UK bank if its ultimate parent is headquartered in the UK, and as a non-UK bank if its ultimate parent is headquartered outside the UK. All variables of interest are defined according to the activity disclosed in the UK. For example, EMPL is defined as the number of employees disclosed in the UK. Panel A of Appendix C provides a summary of the variables of interest. We partition our sample period into three phases: pre-Brexit (2014–2015), during-Brexit (2017–2019), and post-Brexit (2020–2023). We exclude 2013 due to a limited number of observations and 2016 as it represents the referendum year. We keep banks that have observations in both periods to ensure results are not driven by change in sample compositions. We first calculate the difference within a period. For example, the difference in the pre-Brexit period is the difference in our variables of interest between 2014 and 2015. We then calculate the difference in differences across the two periods. In Panels A through D, columns 3 and 6 provide the difference for UK and Non-UK Banks respectively. Columns 4 and 7 report the *p*-values from a Student's t-test to assess whether the differences are significantly different from zero.

Panel A: Number of Employees Disclosed in the UK

	UK Banks			Non-UK Banks		
Period	Obs.	Difference	*p*-value	Obs.	Difference	*p*-value
Pre-Brexit	9	(860)	0.30	65	145	0.21
Post-Brexit	9	(1,298)	0.12	65	(26)	0.62
Difference	9	(438)	0.70	65	(171)	0.25

Panel B: Number of Entities Disclosed in the UK

	UK Banks			Non-UK Banks		
Period	Obs.	Difference	*p*-value	Obs.	Difference	*p*-value
Pre-Brexit	9	(14)	0.15	65	(1)	0.24
Post-Brexit	9	(10)	**0.07**	65	(1)	**0.02**
Difference	9	4	0.72	65	0	0.29

Panel C: Turnover (in £m) Disclosed in the UK

	UK Banks			Non-UK Banks		
Period	Obs.	Difference	*p*-value	Obs.	Difference	*p*-value
Pre-Brexit	9	187	0.42	65	44	0.37
Post-Brexit	9	1,114	0.14	65	150	**0.00**
Difference	9	927	0.25	65	106	0.14

Panel D: Profit/(Loss) Before Tax (in £m) Disclosed in the UK

	UK Banks			Non-UK Banks		
Period	Obs.	Difference	*p*-value	Obs.	Difference	*p*-value
Pre-Brexit	9	(516)	0.11	65	33	0.29
Post-Brexit	9	2,268	**0.02**	65	135	**0.02**
Difference	9	2,784	**0.02**	65	102	0.12

Table 6: Regression Analysis Surrounding Key Brexit Events

Table 6 presents our results for the regression estimate of the effect of key Brexit events. We estimate the following model to examine the effect of Brexit events on our four variables of interest: $Disclosed\ Activity_{i,j,t} = \alpha + \beta_1 Referendum + \beta_2\ Brexit + \beta_3\ UKBank + \beta_4 HQ + \beta_{13} Referendum \times UKBank + \beta_{14} Referendum \times HQ + \beta_{23} Brexit \times UKBank + \beta_{24} Brexit \times HQ + \beta_{34} UKBank \times HQ + \beta_{134} Referendum \times UKBank \times HQ + \beta_{234} Brexit \times UKBank \times HQ + \varepsilon$. Panel A of Appendix C provides the definition of the variables. The dependent variable is the activity disclosed by bank *i* in country *j* in year *t* for the four variables of interest. The standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels respectively.

	(a1)	(a2)	(a3)	(b1)	(b2)	(b3)
Dependent Variable	EMPL	EMPL	EMPL	ENTY	ENTY	ENTY
Referendum	-37.38		-35.58	-1.01		-0.77
	(176.02)		(177.31)	(1.04)		(1.05)
Referendum * UKBank	-8.87		-14.28	-0.53		-0.44
	(250.38)		(274.23)	(1.48)		(1.62)
Referendum * HQ	-985.08*		-616.41	-7.34**		-3.64
	(591.44)		(647.78)	(3.50)		(3.83)
Referendum * UKBank * HQ	-4,154.91***		-3,103.64**	-44.88***		-33.52***
	(1,394.03)		(1,526.83)	(8.24)		(9.02)
Brexit		-47.34	15.22		-1.07	-0.04
		(173.80)	(174.66)		(1.03)	(1.03)
Brexit * UKBank		6.07	10.83		-0.33	-0.18
		(204.43)	(223.90)		(1.21)	(1.32)
Brexit * HQ		-942.81*	-737.34		-8.61***	-7.40**
		(482.91)	(528.91)		(2.86)	(3.13)
Brexit * UKBank * HQ		**-3,137.08*** **	**-2,102.53***		**-33.90*** **	**-22.73*** **
		(1,138.22)	**(1,246.65)**		**(6.73)**	**(7.37)**
UKBank	-228.26	-237.78*	-228.26	-0.44	-0.73	-0.44
	(223.94)	(129.29)	(223.90)	(1.32)	(0.76)	(1.32)
HQ	21,583.42***	21,172.48***	21,583.42***	90.65***	88.22***	90.65***
	(529.00)	(305.42)	(528.91)	(3.13)	(1.81)	(3.13)
UKBank * HQ	7,796.39***	5,727.30***	7,796.39***	70.50***	48.16***	70.50***
	(1,246.86)	(719.88)	(1,246.65)	(7.37)	(4.26)	(7.37)
Constant	351.00***	377.98***	351.00***	2.97***	3.23***	2.97***
	(127.24)	(122.26)	(127.22)	(0.75)	(0.72)	(0.75)
Observations	15,500	15,500	15,500	15,500	15,500	15,500
Adjusted R^2	0.40	0.40	0.40	0.26	0.26	0.26

	(c1)	(c2)	(c3)	(d1)	(d2)	(d3)
Dependent Variable	TURN	TURN	TURN	PLBT	PLBT	PLBT
Referendum	59.45		5.50	48.35***		5.40
	(39.82)		(40.11)	(13.81)		(13.88)
Referendum * UKBank	-15.94		-16.46	-10.98		-12.90
	(56.64)		(62.04)	(19.65)		(21.47)
Referendum * HQ	809.22***		651.37***	400.37***		357.14***
	(133.80)		(146.55)	(46.41)		(50.72)
Referendum * UKBank * HQ	-80.43		-32.75	416.39***		86.34
	(315.38)		(345.43)	(109.39)		(119.54)
Brexit		532.82***	315.70***		51.16***	39.30***
		(109.31)	(119.66)		(13.63)	(13.67)
Brexit * UKBank		66.45*	49.04		-0.45	3.85
		(39.34)	(39.52)		(16.04)	(17.53)
Brexit * HQ		-4.46	1.03		205.51***	86.46**
		(46.27)	(50.66)		(37.88)	(41.41)
Brexit * UKBank * HQ		**-106.28**	**-95.37**		**688.88*** **	**660.10*** **
		(257.64)	**(282.04)**		**(89.28)**	**(97.60)**
UKBank	-41.72	-52.69*	-41.72	-12.96	-21.56**	-12.96
	(50.66)	(29.27)	(50.66)	(17.57)	(10.14)	(17.53)
HQ	4,239.41***	4,673.66***	4,239.41***	547.11***	785.21***	547.11***
	(119.68)	(69.13)	(119.66)	(41.51)	(23.96)	(41.41)
UKBank * HQ	2,348.70***	2,326.87***	2,348.70***	-22.76	34.81	-22.76
	(282.08)	(162.94)	(282.04)	(97.84)	(56.47)	(97.60)
Constant	67.38**	55.47**	67.38**	17.91*	11.45	17.91*
	(28.79)	(27.67)	(28.78)	(9.98)	(9.59)	(9.96)
Observations	15,500	15,500	15,500	15,500	15,500	15,500
Adjusted R^2	0.44	0.44	0.44	0.17	0.18	0.18

Table 7: Activity Disclosed in the UK by UK and EEA Non-G-SIBs

Table 7 presents the activity disclosed in the UK for UK Non-G-SIBs and EEA Non-G-SIBs. A bank is classified as a UK bank if its ultimate parent is headquartered in the UK, and as an EEA bank if its ultimate parent is headquartered in the EEA. All variables of interest are defined according to the activity disclosed in the UK. For example, EMPL is defined as the number of employees disclosed in the UK. Panel A of Appendix C provides a summary of the variables of interest. In Panels A through D, column 3 (7) shows the average values of the variable of interest for UK (Non-UK) banks. Columns 4 and 8 report the average changes from the previous year for UK and Non-UK banks, respectively. Columns 5 and 9 provide the *p*-values from a Student's t-test to assess whether the changes are significantly different from zero. The final column presents the *p*-value from a Student's t-test comparing whether the relative changes (RC) between UK and Non-UK banks is statistically significant.

Panel A: Number of Employees Disclosed in the UK

	UK Non-G-SIBs				EEA Non-G-SIBs				RC
Year	Obs.	EMPL	Change	*p*-value	Obs.	EMPL	Change	*p*-value	*p*-value
2014	6	28,969			33	334			
2015	6	27,763	(1,207)	0.34	33	560	227	0.32	**0.05**
2016	6	25,827	(1,936)	0.29	33	557	(3)	0.69	**0.01**
2017	6	23,949	(1,878)	0.24	33	555	(2)	0.85	**0.00**
2018	6	22,643	(1,306)	0.20	33	554	(1)	0.95	**0.00**
2019	6	21,859	(784)	0.23	33	525	(29)	0.30	**0.00**
2020	6	21,153	(706)	0.20	33	525	0	0.99	**0.00**
2021	6	20,095	(1,058)	0.11	33	477	(48)	0.26	**0.00**
2022	6	19,966	(129)	0.59	33	456	(21)	0.10	0.26
2023	6	20,562	596	0.28	33	463	7	0.46	**0.01**
All Years	60	23,279	(934)	**0.00**	330	501	14	0.57	**0.00**

Panel B: Number of Entities Disclosed in the UK

	UK Non-G-SIBs				EEA Non-G-SIBs				RC
Year	Obs.	ENTY	Change	*p*-value	Obs.	ENTY	Change	*p*-value	*p*-value
2014	6	173			33	7			
2015	6	162	(11)	0.41	33	7	0	0.75	**0.03**
2016	6	147	(15)	0.21	33	7	(0)	0.55	**0.00**
2017	6	135	(12)	0.26	33	6	(0)	0.39	**0.01**
2018	6	126	(9)	0.28	33	6	(0)	**0.02**	**0.01**
2019	6	110	(16)	0.27	33	6	(0)	0.23	**0.00**
2020	6	102	(8)	0.19	33	5	(1)	**0.09**	**0.00**
2021	6	94	(8)	0.17	33	5	(0)	0.80	**0.00**
2022	6	96	2	0.58	33	5	(1)	**0.06**	0.10
2023	6	88	(8)	**0.10**	33	4	(0)	0.17	**0.00**
All Years	60	123	(9)	**0.00**	330	6	(0)	**0.02**	**0.00**

Panel C: Turnover (in £m) Disclosed in the UK

	UK Non-G-SIBs				EEA Non-G-SIBs				RC
Year	Obs.	TURN	Change	*p*-value	Obs.	TURN	Change	*p*-value	*p*-value
2014	6	5,303			33	111			
2015	6	5,465	162	0.47	33	131	19	0.27	0.13
2016	6	5,479	15	0.80	33	157	26	0.17	0.82
2017	6	5,819	340	0.21	33	164	7	0.23	**0.00**
2018	6	5,851	32	0.16	33	151	(13)	0.39	0.23
2019	6	5,921	70	0.55	33	150	(1)	0.96	0.19
2020	6	4,898	(1,024)	0.20	33	129	(21)	**0.03**	**0.00**
2021	6	5,184	286	**0.05**	33	127	(2)	0.65	**0.00**
2022	6	5,947	763	0.12	33	170	43	**0.00**	**0.00**
2023	6	6,390	443	0.22	33	222	52	**0.04**	**0.01**
All Years	60	5,626	121	0.30	330	151	12	**0.01**	**0.03**

Panel D: Profit/(Loss) Before Tax (in £m) Disclosed in the UK

	UK Non-G-SIBs				EEA Non-G-SIBs				RC
Year	Obs.	PLBT	Change	*p*-value	Obs.	PLBT	Change	*p*-value	*p*-value
2014	6	560			33	28			
2015	6	458	(102)	0.54	33	44	16	0.12	**0.09**
2016	6	483	25	0.97	33	55	11	0.28	0.96
2017	6	1,582	1,098	0.28	33	51	(3)	0.56	**0.00**
2018	6	1,788	206	0.26	33	32	(19)	0.17	**0.00**
2019	6	1,426	(362)	0.11	33	41	9	0.56	**0.00**
2020	6	363	(1,063)	0.21	33	(3)	(44)	**0.01**	**0.00**
2021	6	2,067	1,704	0.13	33	40	43	**0.03**	**0.00**
2022	6	2,362	296	0.32	33	61	21	**0.08**	**0.02**
2023	6	2,510	148	0.53	33	82	21	**0.08**	0.18
All Years	60	1,360	217	0.29	330	43	6	0.19	**0.01**

Table 8: Activity Disclosed in the Headquarter Country by UK and EEA Non-GSIBs

Table 8 presents the activity disclosed in the headquarter country for UK non-G-SIBs and EEA Non-G-SIBs. A bank is classified as a UK bank if its ultimate parent is headquartered in the UK, and as a EEA bank if its ultimate parent is headquartered in the EEA. All variables of interest are defined according to the activity disclosed in the headquarter country of the Non-G-SIBs. For example, EMPL for UK Non-G-SIBs is defined as the number of employees disclosed in the UK and for EEA Non-G-SIBs is defined as the number of employees disclosed in the corresponding headquarter country. Panel A of Appendix C provides a summary of the variables of interest. In Panels A through D, column 3 (7) shows the average values of the variable of interest for UK (Non-UK) banks. Columns 4 and 8 report the average changes from the previous year for UK and Non-UK banks, respectively. Columns 5 and 9 provide the *p*-values from a Student's t-test to assess whether the changes are significantly different from zero. The final column presents the *p*-value from a Student's t-test comparing whether the relative changes (RC) between UK and Non-UK banks is statistically significant.

Panel A: Number of Employees Disclosed in the Headquarter Country

	UK Non-G-SIBs				EEA Non-G-SIBs				RC
Year	Obs.	EMPL	Change	*p*-value	Obs.	EMPL	Change	*p*-value	*p*-value
2014	6	28,969			33	13,893			
2015	6	27,763	(1,207)	0.34	33	13,772	(121)	0.58	0.12
2016	6	25,827	(1,936)	0.29	33	13,447	(325)	**0.02**	**0.03**
2017	6	23,949	(1,878)	0.24	33	13,396	(52)	0.86	**0.05**
2018	6	22,643	(1,306)	0.20	33	13,039	(356)	**0.03**	**0.07**
2019	6	21,859	(784)	0.23	33	12,849	(191)	**0.09**	**0.10**
2020	6	21,153	(706)	0.20	33	13,153	304	0.55	0.41
2021	6	20,095	(1,058)	0.11	33	12,570	(583)	**0.06**	0.52
2022	6	19,966	(129)	0.59	33	12,457	(113)	0.44	0.96
2023	6	20,562	596	0.28	33	12,598	141	0.23	0.19
All Years	60	23,279	(934)	**0.00**	330	13,117	(144)	**0.09**	**0.00**

Panel B: Number of Entities Disclosed in the Headquarter Country

	UK Non-G-SIBs				EEA Non-G-SIBs				RC
Year	Obs.	ENTY	Change	*p*-value	Obs.	ENTY	Change	*p*-value	*p*-value
2014	6	173			33	60			
2015	6	162	(11)	0.41	33	58	(2)	0.39	0.22
2016	6	147	(15)	0.21	33	55	(3)	0.17	0.11
2017	6	135	(12)	0.26	33	52	(2)	0.12	**0.07**
2018	6	126	(9)	0.28	33	47	(5)	**0.03**	0.60
2019	6	110	(16)	0.27	33	41	(6)	0.28	0.49
2020	6	102	(8)	0.19	33	38	(3)	0.17	0.33
2021	6	94	(8)	0.17	33	36	(2)	0.14	**0.05**
2022	6	96	2	0.58	33	36	(0)	0.60	0.34
2023	6	88	(8)	**0.10**	33	35	(1)	**0.01**	**0.00**
All Years	60	123	(9)	**0.00**	330	46	(3)	**0.00**	**0.00**

Panel C: Turnover (in £m) Disclosed in the Headquarter Country

	UK Non-G-SIBs				EEA Non-G-SIBs				RC
Year	Obs.	TURN	Change	*p*-value	Obs.	TURN	Change	*p*-value	*p*-value
2014	6	5,303			33	2,879			
2015	6	5,465	162	0.47	33	3,144	264	0.47	0.91
2016	6	5,479	15	0.80	33	3,507	364	**0.00**	0.14
2017	6	5,819	340	0.21	33	3,662	155	**0.02**	0.31
2018	6	5,851	32	0.16	33	3,631	(32)	0.78	0.81
2019	6	5,921	70	0.55	33	3,458	(172)	0.30	0.54
2020	6	4,898	(1,024)	0.20	33	3,384	(75)	0.56	**0.03**
2021	6	5,184	286	**0.05**	33	3,497	113	0.40	0.59
2022	6	5,947	763	0.12	33	3,919	422	**0.00**	0.36
2023	6	6,390	443	0.22	33	4,831	912	**0.04**	0.65
All Years	60	5,626	121	0.30	330	3,591	217	**0.00**	0.59

Panel D: Profit/(Loss) Before Tax (in £m) Disclosed in the Headquarter Country

	UK Non-G-SIBs				EEA Non-G-SIBs				RC
Year	Obs.	PLBT	Change	*p*-value	Obs.	PLBT	Change	*p*-value	*p*-value
2014	6	560			33	363			
2015	6	458	(102)	0.54	33	510	148	0.17	0.33
2016	6	483	25	0.97	33	598	88	0.61	0.90
2017	6	1,582	1,098	0.28	33	903	305	**0.08**	0.15
2018	6	1,788	206	0.26	33	912	8	0.95	0.51
2019	6	1,426	(362)	0.11	33	850	(62)	0.58	0.28
2020	6	363	(1,063)	0.21	33	191	(659)	**0.00**	0.48
2021	6	2,067	1,704	0.13	33	906	716	**0.00**	0.12
2022	6	2,362	296	0.32	33	1,085	179	0.28	0.77
2023	6	2,510	148	0.53	33	1,776	691	**0.00**	0.33
All Years	60	1,360	217	0.29	330	809	157	**0.01**	0.72

Table 9: Activity Disclosed in the UK by G-SIBs

Table 9 presents the activity disclosed in the UK by sample G-SIBs. We focus only on G-SIBs headquartered in the UK and EU (i.e., EEA banks). A bank is classified as a UK G-SIB (EEA G-SIB) if its ultimate parent is headquartered in the UK (EEA). All variables of interest are defined according to the activity disclosed in the UK. For example, EMPL is defined as the number of employees disclosed in the UK. Panel A of Appendix C provides a summary of the variables of interest. In Panels A through D, column 3 (7) shows the average values of the variable of interest for UK (EEA) G-SIBs. Columns 4 and 8 report the average changes from the previous year for UK and EAA G-SIBs, respectively. Columns 5 and 9 provide the *p*-values from a Student's t-test to assess whether the changes are significantly different from zero. The final column presents the *p*-value from a Student's t-test comparing whether the relative changes (RC) between UK and Non-UK G-SIBs is statistically significant.

Panel A: Number of Employees Disclosed in the UK

	UK G-SIBs				EEA G-SIBs				RC
Year	Obs.	EMPL	Change	*p*-value	Obs.	EMPL	Change	*p*-value	*p*-value
2014	3	31,845			8	5,483			
2015	3	31,678	(167)	0.78	8	5,641	158	**0.03**	0.31
2016	3	30,240	(1,438)	0.19	8	5,598	(43)	0.64	**0.01**
2017	3	29,873	(367)	0.65	8	5,842	243	0.19	0.24
2018	3	30,186	312	0.77	8	5,831	(10)	0.90	0.56
2019	3	30,212	26	0.96	8	5,580	(251)	**0.08**	0.43
2020	3	29,819	(393)	0.37	8	5,384	(196)	0.35	0.61
2021	3	28,172	(1,647)	0.25	8	5,064	(321)	0.27	0.10
2022	3	26,300	(1,872)	0.20	8	4,979	(85)	0.55	**0.01**
2023	3	27,106	806	0.43	8	5,320	341	**0.05**	0.39
All Years	30	29,543	(527)	**0.06**	80	5,472	(18)	0.74	**0.01**

Panel B: Number of Entities Disclosed in the UK

	UK G-SIBs				EEA G-SIBs				RC
Year	Obs.	ENTY	Change	*p*-value	Obs.	ENTY	Change	*p*-value	*p*-value
2014	3	166			8	50			
2015	3	146	(19)	0.19	8	48	(3)	0.36	**0.04**
2016	3	138	(8)	0.43	8	43	(4)	0.28	0.63
2017	3	121	(17)	0.17	8	44	1	0.54	**0.01**
2018	3	112	(9)	0.35	8	41	(3)	0.25	0.29
2019	3	102	(10)	**0.06**	8	38	(4)	0.18	0.16
2020	3	99	(3)	0.27	8	37	(1)	0.43	0.61
2021	3	90	(9)	0.38	8	35	(1)	0.34	0.15
2022	3	95	5	0.10	8	34	(2)	**0.06**	**0.00**
2023	3	97	2	0.44	8	35	1	0.68	0.76
All Years	30	117	(8)	**0.00**	80	40	(2)	**0.02**	**0.00**

Panel C: Turnover (in £m) Disclosed in the UK

	UK G-SIBs				EEA G-SIBs				RC
Year	Obs.	TURN	Change	*p*-value	Obs.	TURN	Change	*p*-value	*p*-value
2014	3	8,957			8	1,773			
2015	3	9,193	236	0.73	8	1,722	(51)	0.90	0.70
2016	3	9,821	628	0.54	8	1,866	143	0.17	0.36
2017	3	9,495	(325)	0.77	8	1,923	58	0.21	0.50
2018	3	10,426	930	0.52	8	1,798	(126)	0.20	0.15
2019	3	10,836	410	0.55	8	1,558	(240)	0.27	0.20
2020	3	9,728	(1,108)	0.36	8	1,702	144	0.31	**0.06**
2021	3	11,652	1,924	0.27	8	1,771	69	0.45	**0.03**
2022	3	13,189	1,537	0.28	8	2,280	510	**0.04**	0.16
2023	3	10,085	(3,104)	0.42	8	2,083	(197)	0.25	0.13
All Years	30	10,338	125	0.79	80	1,848	35	0.58	0.77

Panel D: Profit/(Loss) Before Tax (in £m) Disclosed in the UK

	UK G-SIBs				EEA G-SIBs				RC
Year	Obs.	PLBT	Change	*p*-value	Obs.	PLBT	Change	*p*-value	*p*-value
2014	3	1,242			8	258			
2015	3	(102)	(1,345)	0.16	8	135	(123)	0.57	**0.03**
2016	3	577	680	0.52	8	336	202	0.16	0.39
2017	3	(305)	(883)	0.34	8	470	134	0.35	**0.05**
2018	3	935	1,240	0.36	8	364	(106)	0.14	**0.05**
2019	3	(149)	(1,084)	0.41	8	128	(236)	0.25	0.23
2020	3	(1,437)	(1,288)	0.30	8	292	164	0.48	**0.05**
2021	3	3,175	4,613	0.19	8	585	293	0.16	**0.01**
2022	3	3,253	78	0.87	8	900	315	0.11	0.55
2023	3	1,074	(2,179)	0.47	8	798	(102)	0.58	0.17
All Years	30	826	(19)	0.97	80	427	60	0.30	0.82

Table 10: Activity Disclosed in the Headquarter Country by G-SIBs

Table 10 presents the activity disclosed in the headquarter country by sample G-SIBs. We focus only on G-SIBs that are headquartered in the UK and in the EU (i.e., EEA G-SIBs). A bank is classified as a UK G-SIB (EEA G-SIB) if its ultimate parent is headquartered in the UK (EEA). All variables of interest are defined according to the activity disclosed in the headquarter country of the G-SIBs. For example, EMPL for UK G-SIBs is defined as the number of employees disclosed in the UK and for Non-UK G-SIBs is defined as the number of employees disclosed in the corresponding headquarter country. Panel A of Appendix C provides a summary of the variables of interest. In Panels A through D, column 3 (7) shows the average values of the variable of interest for UK (Non-UK) G-SIBs. Columns 4 and 8 report the average changes from the previous year for UK and EEA G-SIBs, respectively. Columns 5 and 9 provide the *p*-values from a Student's t-test to assess whether the changes are significantly different from zero. The final column presents the *p*-value from a Student's t-test comparing whether the relative changes (RC) between UK and Non-UK G-SIBs is statistically significant.

Panel A: Number of Employees Disclosed in the Headquarter Country

	UK G-SIBs				EEA G-SIBs				RC
Year	Obs.	EMPL	Change	*p*-value	Obs.	EMPL	Change	*p*-value	*p*-value
2014	3	31,845			8	55,452			
2015	3	31,678	(167)	0.78	8	55,207	(245)	0.14	0.84
2016	3	30,240	(1,438)	0.19	8	54,716	(491)	**0.04**	0.10
2017	3	29,873	(367)	0.65	8	55,236	520	0.67	0.67
2018	3	30,186	312	0.77	8	55,023	(213)	0.84	0.78
2019	3	30,212	26	0.96	8	54,270	(753)	0.12	0.33
2020	3	29,819	(393)	0.37	8	53,286	(984)	**0.07**	0.48
2021	3	28,172	(1,647)	0.25	8	52,553	(734)	**0.06**	0.27
2022	3	26,300	(1,872)	0.20	8	52,656	103	0.86	0.11
2023	3	27,106	806	0.43	8	53,397	742	0.22	0.95
All Years	30	29,543	(527)	**0.06**	80	54,180	(228)	0.28	0.43

Panel B: Number of Entities Disclosed in the Headquarter Country

	UK G-SIBs				EEA G-SIBs				RC
Year	Obs.	ENTY	Change	*p*-value	Obs.	ENTY	Change	*p*-value	*p*-value
2014	3	166			8	240			
2015	3	146	(19)	0.19	8	232	(8)	0.38	0.49
2016	3	138	(8)	0.43	8	225	(7)	0.70	0.95
2017	3	121	(17)	0.17	8	270	45	**0.05**	**0.08**
2018	3	112	(9)	0.35	8	261	(9)	0.50	0.99
2019	3	102	(10)	**0.06**	8	276	15	0.57	0.57
2020	3	99	(3)	0.27	8	270	(5)	0.29	0.75
2021	3	90	(9)	0.38	8	269	(1)	0.77	0.34
2022	3	95	5	0.10	8	268	(1)	0.78	0.43
2023	3	97	2	0.44	8	271	3	0.68	0.96
All Years	30	117	(8)	**0.00**	80	258	3	0.46	0.15

Panel C: Turnover (in £m) Disclosed in the Headquarter Country

	UK G-SIBs				EEA G-SIBs				RC
Year	Obs.	TURN	Change	*p*-value	Obs.	TURN	Change	*p*-value	*p*-value
2014	3	8,957			8	10,122			
2015	3	9,193	236	0.73	8	9,183	(939)	0.25	0.39
2016	3	9,821	628	0.54	8	10,511	1,328	**0.00**	0.35
2017	3	9,495	(325)	0.77	8	10,794	283	0.35	0.42
2018	3	10,426	930	0.52	8	11,347	553	**0.03**	0.62
2019	3	10,836	410	0.55	8	10,397	(950)	**0.00**	**0.01**
2020	3	9,728	(1,108)	0.36	8	10,450	54	0.88	0.17
2021	3	11,652	1,924	0.27	8	11,021	571	**0.06**	0.14
2022	3	13,189	1,537	0.28	8	11,871	850	**0.01**	0.36
2023	3	10,085	(3,104)	0.42	8	10,711	(1,160)	0.31	0.45
All Years	30	10,338	125	0.79	80	10,641	65	0.72	0.89

Panel D: Profit/(Loss) Before Tax (in £m) Disclosed in the Headquarter Country

	UK G-SIBs				EEA G-SIBs				RC
Year	Obs.	PLBT	Change	*p*-value	Obs.	PLBT	Change	*p*-value	*p*-value
2014	3	1,242			8	1,277			
2015	3	(102)	(1,345)	0.16	8	917	(360)	0.68	0.52
2016	3	577	680	0.52	8	396	(520)	0.74	0.65
2017	3	(305)	(883)	0.34	8	1,976	1,579	0.34	0.38
2018	3	935	1,240	0.36	8	1,804	(171)	0.54	**0.09**
2019	3	(149)	(1,084)	0.41	8	1,432	(373)	0.21	0.36
2020	3	(1,437)	(1,288)	0.30	8	(757)	(2,189)	**0.04**	0.58
2021	3	3,175	4,613	0.19	8	1,811	2,568	**0.02**	0.32
2022	3	3,253	78	0.87	8	1,738	(72)	0.91	0.89
2023	3	1,074	(2,179)	0.47	8	1,809	70	0.92	0.24
All Years	30	826	(19)	0.97	80	1,240	59	0.86	0.90

Table 11: Internationalization of Bank Activities

Table 11 presents statistics related to the internationalization of bank activities. A bank is classified as a UK bank (EEA bank) if its ultimate parent is headquartered in the UK (EEA). In Panels A through D, we define internationalization with respect to each variable of interest as 1 – (activity disclosed for the headquarter country by bank *i* in year *t* divided by total activity disclosed by bank *i* in year *t*). For example, the internationalization measure for a UK bank in terms of employees is calculated as one minus the share of employees disclosed in the UK relative to the total number of employees disclosed globally. In Panels A through D, Column 3 (7) presents the average percentage for UK (EEA) banks. Columns 4 and 8 report the year-on-year average changes for UK and EEA banks, respectively. Columns 5 and 9 provide the *p*-values from a Student's t-test evaluating whether these changes are significantly different from zero. The final column presents the *p*-value from a Student's t-test assessing whether the difference in year-on-year changes between UK and non-UK banks is statistically significant.

Panel A: Number of Employees

	UK Banks				EEA Banks				Diff.
Year	Obs.	EMPL	Change	*p*-value	Obs.	EMPL	Change	*p*-value	*p*-value
2014	9	39%			41	35%			
2015	9	34%	(6%)	0.28	41	35%	1%	0.45	**0.03**
2016	9	34%	0%	0.64	41	37%	1%	0.17	0.63
2017	9	32%	(2%)	0.22	41	35%	(1%)	**0.08**	0.83
2018	9	31%	(1%)	0.33	41	35%	0%	0.97	0.39
2019	9	32%	0%	0.45	41	35%	0%	0.88	0.70
2020	9	31%	0%	0.71	41	35%	0%	0.92	0.99
2021	9	30%	(1%)	0.45	41	36%	0%	0.41	0.11
2022	9	31%	1%	0.20	41	35%	0%	0.29	**0.08**
2023	9	32%	1%	**0.02**	41	35%	0%	0.46	**0.05**
All Years	90	33%	(1%)	0.20	410	35%	0%	0.80	**0.09**

Panel B: Number of Entities

	UK Banks				EEA Banks				Diff.
Year	Obs.	ENTY	Change	*p*-value	Obs.	ENTY	Change	*p*-value	*p*-value
2014	9	55%			41	59%			
2015	9	53%	(2%)	0.32	41	59%	0%	0.80	0.12
2016	9	52%	(1%)	**0.03**	41	59%	0%	0.67	0.76
2017	9	50%	(2%)	0.10	41	58%	(1%)	0.15	0.24
2018	9	50%	1%	0.44	41	58%	0%	0.43	0.33
2019	9	49%	(1%)	0.17	41	58%	1%	0.51	0.32
2020	9	45%	(4%)	0.22	41	59%	1%	0.43	**0.06**
2021	9	44%	(1%)	0.37	41	59%	0%	1.00	0.36
2022	9	43%	(1%)	0.38	41	58%	(1%)	0.08	0.91
2023	9	44%	2%	0.30	41	57%	(2%)	**0.03**	**0.07**
All Years	90	48%	(1%)	**0.03**	410	59%	0%	0.21	0.12

Panel C: Turnover

	UK Banks				EEA Banks				Diff.
Year	Obs.	TURN	Change	*p*-value	Obs.	TURN	Change	*p*-value	*p*-value
2014	9	35%			41	34%			
2015	9	28%	(7%)	0.12	41	35%	1%	0.44	**0.00**
2016	9	29%	1%	0.49	41	35%	0%	0.95	0.65
2017	9	28%	0%	0.40	41	33%	(2%)	**0.06**	0.53
2018	9	28%	0%	0.24	41	34%	1%	0.28	0.35
2019	9	27%	(1%)	0.12	41	34%	1%	0.27	0.22
2020	9	27%	0%	0.64	41	33%	(1%)	0.10	0.33
2021	9	25%	(2%)	**0.07**	41	32%	(1%)	0.14	0.55
2022	9	25%	0%	0.84	41	33%	1%	0.17	0.45
2023	9	28%	3%	0.13	41	35%	2%	0.20	0.52
All Years	90	28%	(1%)	0.19	410	34%	0%	0.72	0.15

Panel D: Profit/(Loss) Before Tax

	UK Banks				EEA Banks				Diff.
Year	Obs.	PLBT	Change	*p*-value	Obs.	PLBT	Change	*p*-value	*p*-value
2014	9	46%			41	41%			
2015	9	20%	(26%)	0.28	41	34%	(7%)	0.26	0.27
2016	9	42%	22%	0.46	41	39%	5%	0.50	0.42
2017	9	30%	(12%)	0.25	41	52%	13%	0.11	0.16
2018	9	30%	0%	0.97	41	49%	(3%)	0.76	0.88
2019	9	39%	9%	0.16	41	39%	(10%)	0.41	0.47
2020	9	54%	15%	0.44	41	41%	1%	0.95	0.75
2021	9	27%	(27%)	0.25	41	39%	(1%)	0.95	0.52
2022	9	25%	(2%)	0.61	41	30%	(9%)	0.39	0.75
2023	9	26%	2%	0.82	41	36%	6%	0.60	0.86
All Years	90	34%	(2%)	0.69	410	40%	(1%)	0.88	0.87