# Brexit and the Ties that Bind:

# How Global Finance Shapes City-Level Growth Models

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*Abstract*

This paper contributes to the Growth Model (GM) research program by analyzing the impact of Brexit on London and other financial centers within the EU. We argue that for many countries, national growth models are really *city-level* growth models, and that this is directly observable in the relationship between GMs and their financial centers. Such city-level GMs are possible precisely because they do not depend on, nor are they deeply integrated into, the rest of their national economy. To explain these observations, we argue that 'place-specific social capital' and professional 'linked ecologies' within these cities make such GMs highly robust to external shocks. Empirically, we develop this argument using bank-level data to observe the movement of loans, jobs and financial assets at city level within the EU financial centers after Brexit. We conclude with some observations on what this means for the study of comparative and international political economy.

*Introduction*

Recent research in comparative and international political economy has sought to address the criticism of ontological nationalism levelled at the 'Growth Model' (GM) research program by better specifying the integration of global and regional growth drivers (Kohler and Stockhammer 2021; Schwartz and Blyth 2022; Bacarro, Blyth and Pontusson – 2022), and by focusing on cases of foreign investment led growth where the strategies of transnational corporations determine local outcomes (Bohle and Regan 2021). This article builds upon this critique in two ways.[1] The first is theoretical. We bring GM theory into a conversation with economic geography and economic sociology. Insights from economic geography allow us to analyze how scale and agglomeration effects peculiar to city level GMs affect growth. Insights from economic sociology, in turn, allow us to view city level GMs as urban centers of social reproduction to better augment our understanding of how *place specific social capital and linked professional ecologies* shape the domestic political economy. The second is empirical, which is provided by the natural experiment of Brexit, and the impact this will have on London and the other financial centers scattered across the European continent.

Brexit, as commentators have noted, is the first international trade agreement in modern history designed to raise trade barriers (Sampson 2017; O'Rourke 2019). It also excludes, for the moment at least, trade in services, which is where the UK has its main comparative advantage, particularly in financial services. This is significant because the regulatory divergence that is the essence of Brexit will, by definition, raise border and transaction costs for global financial firms inside the UK. As Hantzsche et al argue (2019), this will necessarily impact UK growth, given that the UK's GM is heavily dependent on financial services in

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[1] See Farrell and Newman (2014) for a review of similar critiques of methodological nationalism in international politics – and a defence of a new strategic interdependence approach.

London (see Kalaitzake 2020 and Lavery et al 2019). Finance produces 7 percent of the UK's GDP, 10 percent of tax revenue, and 5 percent of employment - not to mention its broader impact on the domestic UK market. If London's financial firms decide to move to a lower cost environment, or they are compelled to do so by a lack of regulatory equivalence post-Brexit, then this should impact the future of the UK's finance-led growth model.

That observation brings us to the issue of scale effects in GM theory. Given the size of the UK economy, if a small percentage of its financial sector moves, for example, to the EU via Ireland, then that may have a disproportionate impact on the Irish GM. For example, such an augmentation could further destabilize the current politics of the Irish GM if it further contributes toward increasing housing inequalities in Dublin City, the major growth node of the Irish economy. The same is true with Amsterdam, where euro-denominated share trading shifted from London in 2018 (Lavery et al 2018; Heneghan and Hall 2020).

Two other European financial centers that potentially stand to gain from Brexit are Paris and Frankfurt. Both hope to prize the euro-denominated derivatives *clearing* trade from London at the end of the period of regulatory equivalence in 2022 (Lavery et al 2019). Doing so would establish either city as a significant global financial center given the volumes of deals involved. Moreover, if either of these other cities 'wins' clearing, which is so central to the movement of money around the world, they would probably become the global financial regulatory hub for the whole of Europe, further impacting their national GM.

This leads us to the second issue that we wish to investigate. That not only do global financial flows matter for national level GMs, but when we talk about national GM's, what we may actually be talking about are *city-level* GMs. This broader theoretical question has not been addressed in the debate on 'relocation or resilience' (Kalaitzake 2021). For example, the Irish GM is effectively Dublin. The capital city generates 50 percent of Irish GDP, and almost two thirds of the foreign direct investment (FDI) that shapes the Irish GM's flows to and

through Dublin. The Netherlands is not Amsterdam, for sure, but Amsterdam produces one third of Dutch GDP.[2] The same is true of Paris in relation to France.[3] So any boost to these cities, which is what Brexit potentially augers, could have a disproportionate impact on their underlying *national* GM.[4] Turning back to the UK, London is 22 percent of UK GVAt. Much of the rest of the country effectively lives-off transfers from London. Brexit therefore poses an interesting theoretical puzzle with deep implications for GM theory and international politics. If national growth models are really, in some crucial cases, city-level growth models, what does that mean for how we should conceptualize and measure the determinants of growth within comparative and international political economy research?

To answer these questions the remainder of the paper is structured as follows. First, we use Brexit to analyze how scale at the city-level matters for both global finance and local growth and why place-specific social capital combines with professional linked-ecologies to keep them rooted in place. Second, we examine the changing regional geography of financial centers in Europe. Third, we examine the evidence and data on the effects of Brexit on other financial centers in Europe - Paris, Frankfurt, Amsterdam and Dublin. The final section concludes with a theoretical discussion on what these findings imply for the growth model research program in comparative and international political economy.

*Theory: Scale and GMs*

Scale rather obviously matters for growth. Very large consumption driven economies such as the USA can have multiple growth drivers across diverse economic regions. Small open economies face an entirely different set of constraints, given that they are entirely dependent

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[2] OECD: Cities and Regions at a Glance: https://www.oecd.org/regional/NETHERLANDS-Regions-and-Cities-2018.pdf Accessed 16:02pm February 5th 2022
[3] OECD: Cities and Regions at a Glance: https://www.oecd.org/cfe/FRANCE-Regions-and-Cities-2018.pdf Accessed 16:04pm February 5th 2022
[4] While Frankfurt's financial center is much smaller and of less importance to the German export-led GM, systemic risk, if brought home to Frankfurt, may have a similar, but downside, risk.

on the consumption habits of other countries and must generate a current account surplus over the long term to finance their imports. Focusing on cities, large and relatively closed demand-led economies such as the USA and China can accommodate multiple cities that do not overly contribute to national income or define the national growth model – Shanghai is not Beijing, and DC is not LA. But for small open economies, and for (some) of the consumption-driven economies in Europe, this is not the case. In these countries, the major financial centre often defines the GM and generates the GVA that the rest of the country lives off. As such, changes to particular cities that could be wrought by Brexit causing finance to move its activities could prove materially important to how we understand these 'national' GM's.[5] This suggests two claims about national GM's and the issue of scale in world politics.

First, in line with literatures on 'too much finance' (Deeg and O'Sullivan 2009; Baker et al. 2018) and (appropriately) 'Dutch disease,' if national GMs are really globally interconnected city-level GMs that generate the value added that keeps the rest of the national economy going, can the capture of trading and other activities from London materially alter the overall national domestic growth model? And if it can, should such cities 'be careful what they wish for?' insofar as such windfalls could be more distortionary than productive? This would suggest that scale really matters for national GMs, but in an unusual way insofar as the scale effect of being tied into the international economy is *amplified downwards* through the city into the rest of the national economy, and not upward to and through the wider international economy. It would also suggest that the effect of financial flows and mobile capital on GMs in general is strong insofar as they affect the big as well as the small. For example, it is perhaps not a surprise that Latvia's GM lives off global financial flows to Riga, but it is more surprising that this may be true for London or Paris.

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[5] Breznitz (2021) suggest a similar effect with the growth of technology sectors whereby the wealth generated creates no spillovers for the broader economy and may even be net negative against it.

Second, and contrarywise, what if such financial flows are in fact less 'mobile' than we think, especially when they are intermediated at scale? Specifically, what if Brexit results in regulatory divergence and increasing border costs but the valuable parts of finance do not actually move out of London? What would that tell us about the role of cities in GMs, and what keeps financial firms *local* despite capital being the most global of flows? We argue that what makes finance important for growth, and what alters GMs income and wealth drivers are not global financial flows *per se*. Rather, it is the wealth that financial assets generate from the dynamics of place-specific social capital and linked professional-ecologies. These intricate labor markets are deeply embedded in global wealth chains and far less mobile than we think.

*Theory: Place Specific Social Capital and Linked Ecologies*

Place-specific social capital is the key social resource underpinning the process of wealth generation. As Young et al., (2016: 425) argue, "when economic success is a joint product – rather than a purely individual accomplishment – there is a difficult network coordination problem for migration." Specifically, firms may seek to move particular activities to new locations, but in doing so they may harm, rather than help, a firm's bottom line.

In this view, high value-added activities within cities are contingent products of "deeply embedded insiders who yield remarkable returns in part because of their social placement in a localized economic world" (Ibid.). As such, firms need to be *'in place'* to make a deal happen, and firms need a stable and embedded ecosystem of deal-making and legal expertise to be able to close and enforce their contracts.[6] As a result, the network effects of a dense financial service center - the quality of regulation, the ability to leverage existing expertise to launch new markets, the ability to find diverse and adaptable skills – matters greatly

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[6] That is, agglomeration effects matter, but agglomeration is a function of professional specialization as well as scale.

(see Cassis and Wójcik 2018). Given this, if a given global financial center within a city has these assets and networks in place, it is likely to keep them. Or at the very least, it should be hard to replicate them elsewhere.

Seabrooke and Tsingou (2021) give these insights greater theoretical specificity in relation to finance-led GMs with their concept of 'linked professional ecologies,' where economic agents "create links and form boundaries around issues that are emergent," in order to profit from them (2021: 296). Such ecologies are central to finance as an enterprise, and the more and varied such ecologies are located in a given city, the greater are the opportunities for such agents to innovate and engage in new lines of business, which spurs further network density and 'epistemic arbitrage' (Seabrooke 2014).

For example, having deep capital markets, a strong Venture Capital (VC) culture, and a diversified exchange architecture makes it possible for entirely new lines of business to emerge, by layering new activities on top of existing lines. London is emerging as a global crypto-currency hub precisely because of its diversity of exchanges, and this in turn makes the city a magnet for fin-tech firms that use crypto-architecture for their own businesses. Each of these ecologies – listing – crypto – fin-tech – only exist because of the presence of the others, and because agents can move between ecologies, spurring innovation. Such organic processes are extremely hard to either start from scratch (as the failure of Singapore and Paris to become fin-tech hubs despite government support demonstrates) or to replicate by incentivizing firms to move via altering relative prices. As such, the parts of finance that are likely to move, if they are likely to move at all, are the low margin and low value-added parts of the business.

In sum, what matters in terms of whether finance moves in response to shocks such as Brexit are whether those sub-sectors of financial activities that significantly augment national GVA, add to the national tax base, and significantly affect national employment and growth

patterns, move. If they do not, then place specific social capital and diverse linked ecologies will trump the risks of divergence.

Brexit gives us an opportunity to test these propositions, albeit with preliminary data. In what follows we discuss the literature on the expected impact of Brexit on the City of London. We then examine the data on what has happened to banking and financial services since the Brexit referendum in 2016, and more tentatively, since the shape of the UK's withdrawal agreement became clear in 2020. We argue that such data reveal that scale not only matters for GMs when one moves up from micro-states to small open exporters, and from large consumption economies to global regional blocs. It matters on the *way down* too, from the national GM to the level of the city. Moreover, given the embeddedness of high-tech urban cities for national-level growth models, and in line with Kalaitzake (2021a and b), it is our expectation that city-level financial centers will not easily relocate to other jurisdictions.

*Brexit and GMs*

Heneghan and Hall (2021:44) make the important observation that when financial centers are hit by a macroeconomic shock they tend to rebound quickly given the support they receive from governments. However, while employment in the core recovers, financial employment outside of the core (in so called 'back office' functions) declines. This is materially significant for the UK because two thirds of financial sector employment is located *outside* of London, even if almost all the high value-added and high tax generating jobs are located *inside* London. Brexit therefore constitutes a material threat to employment outside of London in one of the few positive GVA sectors of the UK's GM as firms may adjust by remaining in London but allow their 'back office' functions to 'take the hit.' Such an analysis presupposes however that Brexit constitutes such a 'hit.' This is not at all obvious when we examine the UK-growth model through the lens of London finance. In the words of Kalaitzake

(2021a) London City has "structural power." The depth and complexity of its financial system makes it strategically important for *both* the EU and the UK. As such, Brexit may be a shock, but finance firms are resilient.

Kalaitzake's core argument is that London provides functions for the EU's non-financial sector that no other EU-based city can replicate because London's financial ecosystem generates increasing returns to scale. This takes place through the centrality of UK common law to the bond market, the physical proximity of markets to large data centers within the UK and to the transatlantic underwater cables linking London to New York. The implication is that London produces efficiency gains and lower costs than other rival centers on the European mainland. As such, rival centers in Europe are 'paper tigers.' They never developed the same competencies and cannot compete with London (Lysandrou, Nesvetailova, and Palan 2107).

Crucially, London is the home of much of the EU's digital financial infrastructure in the form of Central Counterparty Clearing firms, which "handle 82% of all EU related interest rate derivatives (used by EU firms to hedge risk) and clears a full 70% of Euro-Denominated Trades" (Kalaitzake 2021a: 12). These clearing houses have important secondary functions as regards EU monetary policy given the centrality of Repo markets to EU finance (Gabor and Ban 2017). Similarly, in other high value-added areas such as asset management, whereby even if the notional amount of assets under management of Germany and France combined is 75 percent of London's share, almost 90 percent of total assets are 'delegated' back to London in terms of active portfolio management (Kalaitzake 2021a: 13).

Recognizing these vulnerabilities for the EU, Kalaitzake (2021a: 17-19) argues that the decision by the EU to grant full equivalence to CCPs, the decision to protect delegation of portfolio management to London, and the decision to roll over passporting rights to UK domiciled firms constitutes "decisive evidence" (Kalaitzake 2021a: 15) for the structural power

of the UK financial sector vis-a-vis the EU. Moving in the same direction are further EU 'climb downs' on share trading, insurance listing, and the whole 'temporary permissions regime' offered by the UK to keep EU firms in London. All of this would effectively suggest that London is setting the agenda rather than the EU.

Kalaitzake (2021b) updates this analysis noting that total financial sector employment is now higher than it was before the referendum, with major US firms opening up, rather than closing down, London office space (at least until the pandemic hit). And while the UK economy as whole has performed badly post-Brexit, as one would expect, the financial sector remains resilient. In terms of FDI coming into the UK, the financial sector has seen significant growth with new fin-tech and VC activities leading the way (Kalaitzake 2021b: 8-9). Moreover, given the centrality of London for the Euromarkets and the consequent production of offshore dollar loans, London' foreign exchange footprint is expanding rather than shrinking post-Brexit. And as a linked ecologies perspective would predict, this is precisely why London dominates the emerging space of offshore RMB trading.

Kalaitzake offers a powerful set of empirical arguments for why the core value added of London-finance will not move in response to Brexit. As such, we can expect broad continuity in the London-centered finance-driven growth model. But now that the withdrawal agreement has been signed and the extensions granted to finance for the period 2017-2020 are running out, are these structural ties still so *binding*, or are they actually blinding us to ongoing changes in the UK-finance driven GM that such structural approaches tend to downplay? Stress testing such structural arguments gives us analytic purchase on the City-led GM question.

Consider that, despite such forces for resilience, Amsterdam overtook London as the main share trading hub for the EU in February 2021.[7] Despite the impeccable logic for the

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[7] Philip Stafford, "Amsterdam Ousts London as Europe's Top Share Trading Hub," Financial Times, February 10th 2021: https://www.ft.com/content/3dad4ef3-59e8-437e-8f63-f629a5b7d0aa Accessed 16:50pm February 5th 2022

centrality of CCPs and the immobility of those trades due to the centrality of London as a data hub and cable connections network hub (Casis and Wojcik 2021: 570), derivatives clearing has indeed begun to move out of London. In mid-2020 London cleared 40% of Over the Counter (OTC) swaps. By January 2021 that had fallen to 10% with Paris, London and Amsterdam each taking some of that trade.[8] Some 44 percent of financial firms based in London plan to move 'some' operation to the EU in 2021 along with £1.3 Trillion in assets.[9] Meanwhile, Euronext is moving its servers from Essex to Italy to comply with EU data protection requirements.[10]

The UK also seems to be banking on the EU playing hardball going forward on equivalence decisions. Chancellor Sunak announced a set of new equivalence offers in November 2020 to which the EU has yet to respond. The UK has instead responded with new regulatory initiatives on listings and competitiveness,[11] and on making London a hub for cryptocurrency trading,[12] and climate finance, as we would predict. And while only $1.2 trillion in assets and 7,500 jobs had left London by October 2020, it is far from clear that this trickle will not become a major leak and turn into a flood.[13] If this is the case, and our arguments about scale and cities are correct, then while this may have somewhat distortionary effects for other European capitals, such a flood could prove extremely disruptive for the UK's GM.

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[8] Philip Stafford, "Fresh Blow for London as Euro Derivatives Trading Floods out," Financial Times, February 11th 2021: https://www.ft.com/content/2f0b8870-c382-494e-afbe-4c56713fc78d Accessed 16:51pm February 5th 2022

[9] EY Financial Services Brexit Tracker: https://www.ey.com/en_uk/news/2021/12/ey-financial-services-brexit-tracker-brexit-activity-muted-over-2021-with-total-relocations-revised-down-and-few-major-operational-announcements 20th December 2021 Accessed 16:54pm February 5th 2022

[10] Sam Fleming, Philip Stafford, and Laura Noonan, The EU Versus the City of London: A Slow Puncture, Financial Times, January 10th 2022. https://www.ft.com/content/f83ddf05-e7a1-4c9b-83ad-e82a54c71afa?accessToken=zwAAAX6swfelkdP4Pd8F56FMm9ODregqVMca-g.MEUCIQDsMjL-E6EJb71wwA0I1k4HF4KKb1p1MDYkrGZ0uyOy3gIgCdH34OeQzIAilqoGh7WPhoi8npPjpjAXPngKfkCzPCU&sharetype=gift?token=1f35f573-9fa5-41cd-a261-f527c2087528 Accessed 16:57 February 5th 2022

[11] HM Treasury, Policy Paper, Terms of Reference: Lord Hill's Review of Listings, April 21st 2021 https://www.gov.uk/government/publications/uk-listings-review/terms-of-reference-lord-hills-review-on-listings Accessed 16:59 February 5th 2022.

[12] HM Treasury, Closed Consultation, "UK regulatory approach to Cryptoassets and Stablecoins: consultation and call for evidence," January 7th 2021, https://www.gov.uk/government/consultations/uk-regulatory-approach-to-cryptoassets-and-stablecoins-consultation-and-call-for-evidence Accessed 17:01February 5th 2022.

[13] EY Financial Services Brexit Tracker, https://www.ey.com/en_uk/news/2020/09/ey-financial-services-brexit-tracker-fs-firms-continue-moving-staff-ahead-of-brexit-deadline 1st October 2020. Accessed 17:03 February 5th 2022.

Given this, perhaps London may lose out in the *long term*? This is what is implied in the analysis of James and Quaglia (2019). They argue that while the City very much wanted 'business as usual' and market access, the politics of Brexit – and the malodor of the financial sector post 2008 – combined to make UK politicians recalibrate what the interests of finance 'really' are (regulatory divergence), and to make UK negotiators more sensitive to aspects of competitive advantage the UK may have in the face of future regulatory divergence. Furthermore, they suggest that the structural dependence of the EU on London may only be short term, as seen in the EU decision of May 4th 2017 to make the relocation of Clearing Houses a matter of EU policy, which in turns animates competition for business from Paris and Frankfurt, as each hold rival Clearing houses (Clearnet and Eurex respectively). As such, EU negotiators baked financial services leaving London into the Brexit withdrawal agreement.
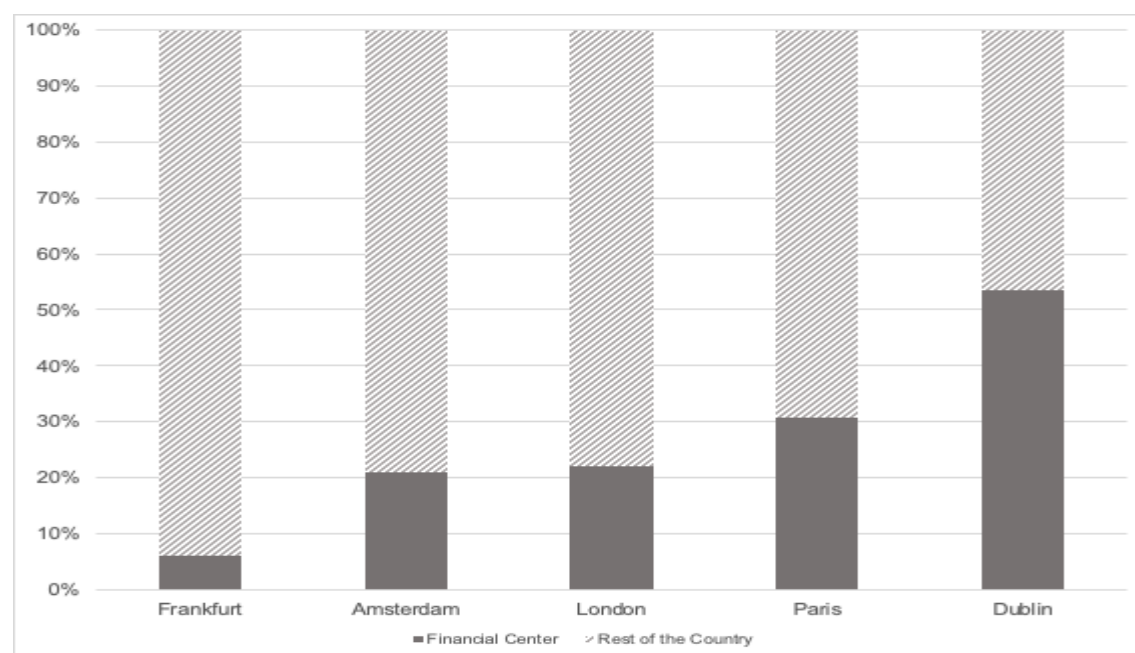
However, notwithstanding these important observations and recognizing that time remains an important variable, we still think that place specific social capital and linked professional ecologies are likely to prevail. Unlike Kalaitzake's more structural argument, we theoretically trace this resilience to the dynamics and scale effects of city-states within national growth models. We conceptualize London, Dublin, Amsterdam, Paris and Frankfurt as financial centers that occupy different niches within a global wealth chain (Seabrooke 2022). This means they are likely to generate different but complementary types of financial growth. We will now examine the data.

*Financial Centers and GMs*

Our first claim is that financial centers play a crucial role in shaping a country's GM. We test this empirically by looking at data on GDP at regional level. In Figure 1 we compare the weight of each financial center over its domestic economy in terms of GDP (we look at average GDP for the period 2008-2019). In particular, we look at the NUTS 2 subnational units

of each financial center, which is the most granular level we can examine for cross-country comparison.

**Figure 1:** Share of GDP of each financial center over the total domestic GDP (average 2008-2019)



**Source:** authors' own elaboration on data from Eurostat and ONS. Note: GDP data are at NUTS-2 level. Data for the UK starts in 2008, whereas the time series for all the other countries starts in 2010. Data for France starts in 2015. Data for the UK are from the ONS whereas data on all the other countries are from Eurostat.

While Figure 1 clearly shows that financial centers play a crucial role in shaping economic growth, it also suggests that their weights vary across countries. Frankfurt accounts for about six percent of Germany's GDP, whereas Dublin is responsible for 54 percent of Irish GDP. Paris's share is around one third of French GDP, whereas London and Amsterdam produce 22 and 21 percent of their domestic GDP respectively.[14]

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[14] For comparability, we compute London's contribution to GDP based on the ITL1 tier of the ONS, which includes Inner London and Outer London. This geographical area includes the ITL2 tier unit of Inner London (West and East), which in 2019 accounted for around 16 percent of the UK's GDP according to ONS data.

However, focusing solely on the weight of each city may be misleading, as it does not take into account the subnational composition of each country. For instance, the higher weight of Dublin might be explained by the fact that Ireland is split into three geographic units only. By contrast, other countries have a higher number of units through which GDP is distributed: the UK has 41, Germany 38, France 28, and the Netherlands 13.
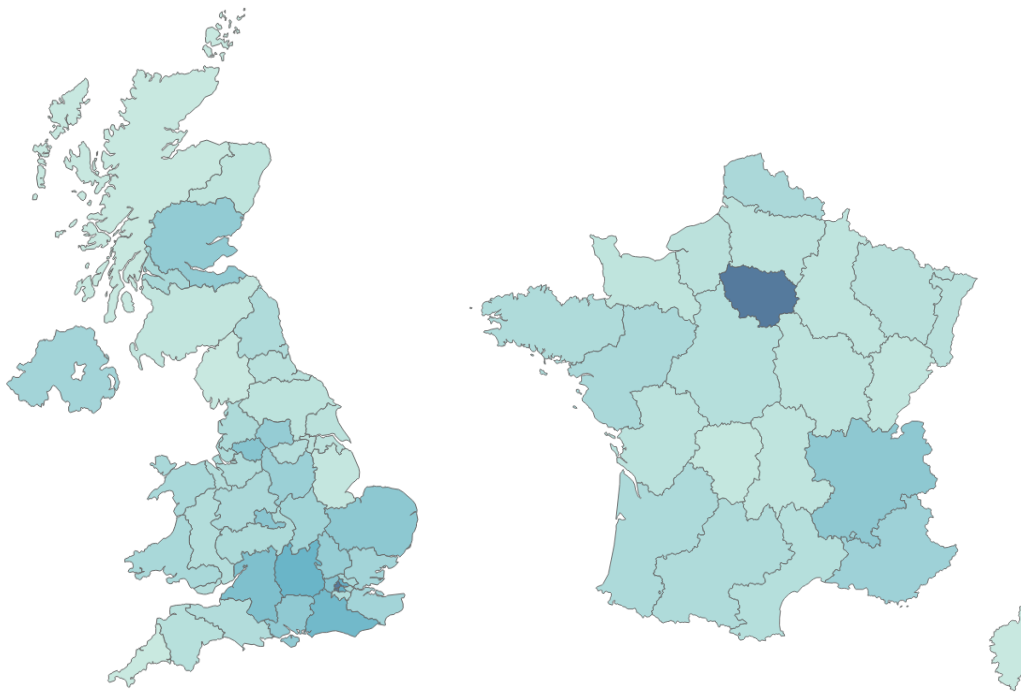
To address this issue, we plot the GDP contribution of each region in the five countries under analysis (Figure 2). This spatial decomposition of GDP allows us to better understand the extent to which each country depends on its financial center vis-à-vis other subnational units. Darker shades of blue indicate a higher share of domestic GDP for the NUTS-2 level unit. The figure clearly illustrates that London (Inner London) and Paris (Île-de-France) stand out as the main engines of domestic economic growth relative to the other subnational territories.
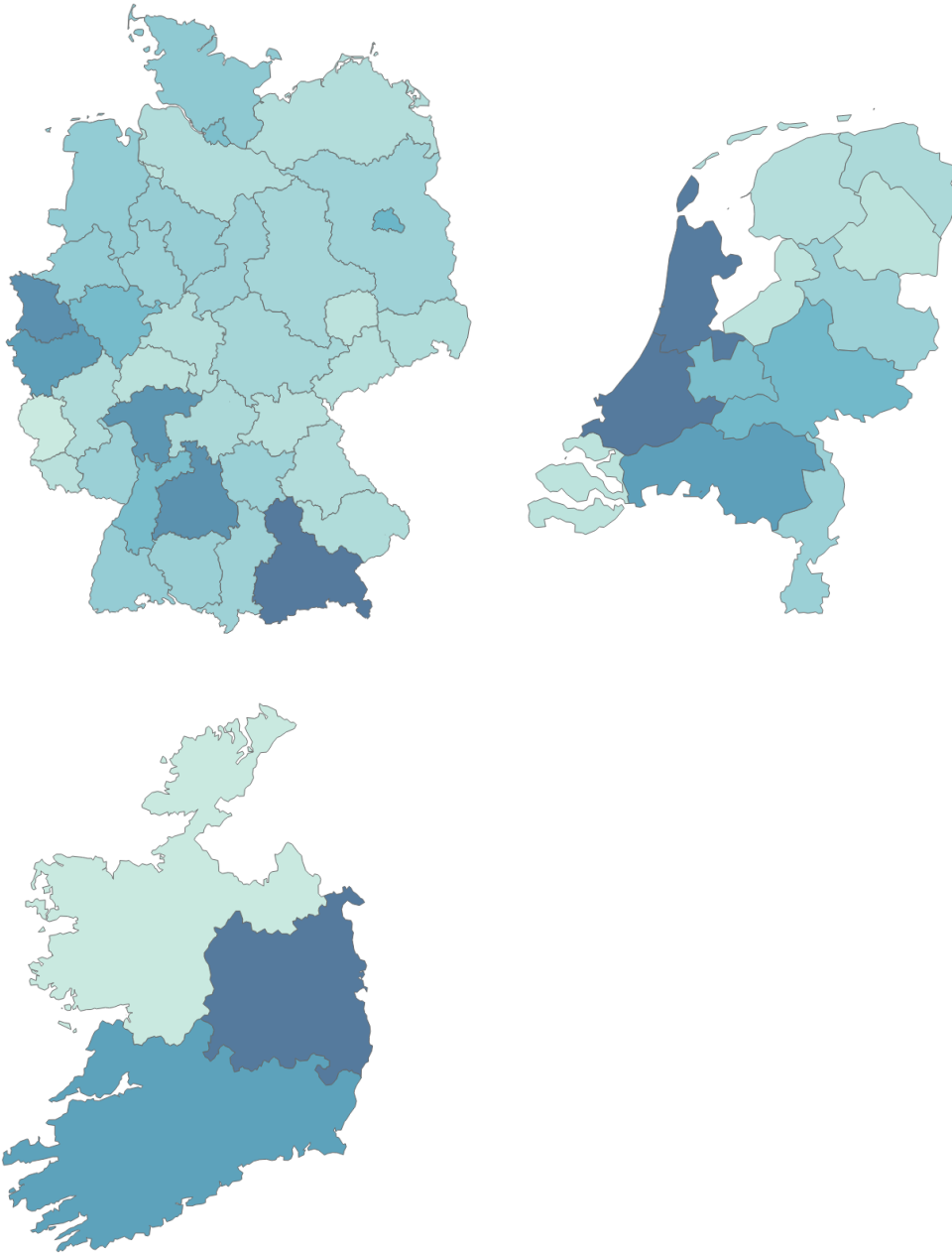
While the same holds true for Ireland, Germany and the Netherlands present a different pattern. In the Netherlands, the role of Amsterdam (North Holland) is counterbalanced by the economic strength of Rotterdam (South Holland), which hosts Europe's largest seaport and presents a comparable share of GDP. In Germany the economic power of Frankfurt is even lower than that of Munich (Oberbayern) and is comparable to that of Stuttgart and Düsseldorf.

This geographical analysis allows us to better understand the contribution of financial centers to their domestic GDP. For instance, while Paris and Amsterdam had similar shares of GDP (see Figure 1), Figure 2 shows that the French capital stands out as the most productive subnational unit, while Amsterdam shares such role with Rotterdam, which is a crucial source of non-financial growth (mostly in the sectors of manufacturing and transport; see Trip et al. 2016). Germany displays a more balanced GM that does not rely solely on its financial center, but rather depends on multiple productive centers in different parts of the country. The opposite holds for the UK and Ireland, which mainly rely on their respective capital cities.

Overall, this analysis delineates the presence of two opposite GMs that differ in the role they assign to their financial centers. On the one hand, we have a city-level growth model that is fully dependent on the financial center. This is visible in the high geographical concentration of GDP in Paris, Dublin, and London. On the other hand, Germany and the Netherlands display a less city-dependent growth model. The distribution of GDP is more balanced in Germany, as it is not fully concentrated in Frankfurt and relies on productive centers in Bavaria and Baden-Württemberg. The Dutch model is similar, as its growth is evenly distributed between its financial center, Amsterdam, and South Holland.

**Figure 2:** Spatial distribution of domestic GDP, by NUTS-2 level regions

Source: authors' own elaboration on data from Eurostat and ONS. Note: darker shades indicate a higher share of domestic GDP.

Having assessed these different roles of financial centers within their domestic economies, we now compare the financial centers with one another. We exploit the Brexit referendum as an experiment that changed the role of London in the overall financial ecosystem with potential repercussions on the other EU's financial cities.

*Empirical Analysis: The Impact of Brexit on London and EU Financial Centers*
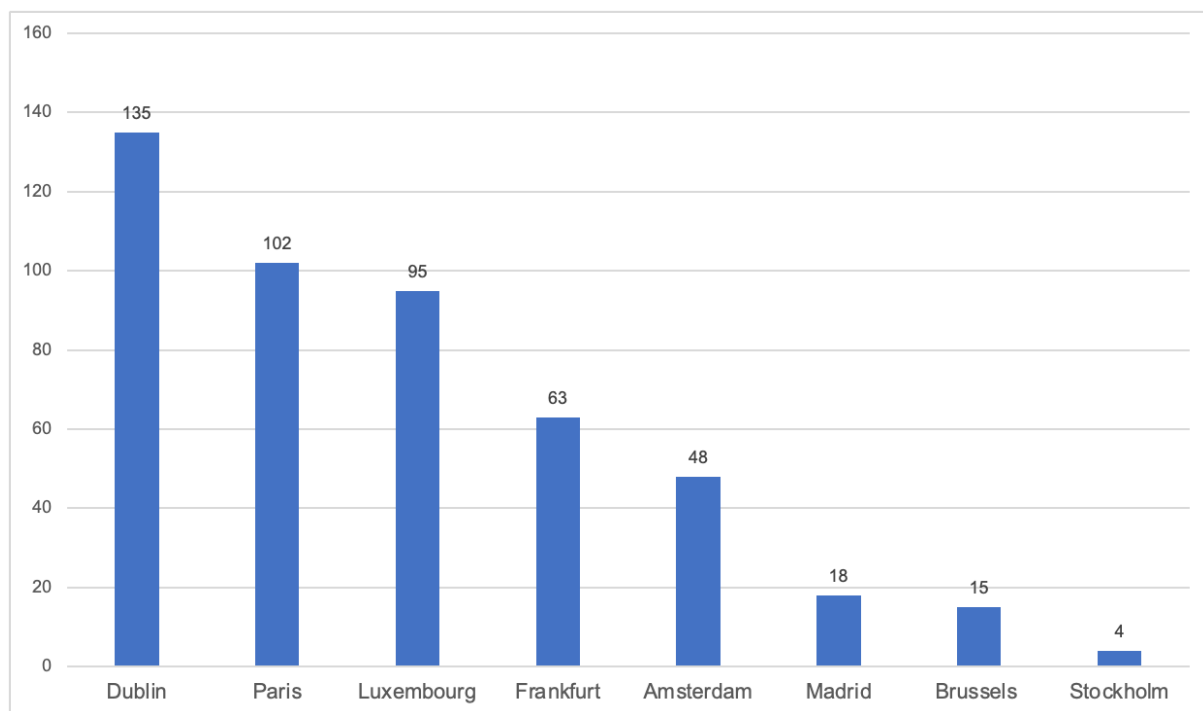
Preliminary evidence based on stock market data shows that UK banks experienced the largest drop in returns ten days after the Brexit referendum (Ramiah et al. 2017). However, Brexit shook EU banks too. Schiereck et al. (2016) found that for EU banks the short-run drop in stock prices experienced after the result of the referendum was more pronounced than the drop following Lehman's collapse. Berg et al. (2021) show that the Brexit referendum caused a     twenty-four percent contraction in the number and volume of syndicated loans emanating from London. The most striking finding of this research is that the fall in loans mostly stems from *a drop in demand for such loans by UK firms.* According to Berg et al. (2021), this shows that London has not lost its attractiveness as a global financial center among foreign borrowers, and international investors more broadly. Rather the impact fell on domestic UK banks.

It is no secret that Brexit is considered by EU policymakers as an opportunity for a European city within the Single Market to attract London-based business. Hamre and Wright (2021) identified more than 440 London-based firms in the banking and finance sector that relocated     their business to the EU, moving staff or setting up new entities in the EU's other key financial centers - Paris, Frankfurt, Amsterdam and London. Figure 3 shows where these London-based firms decided to relocate. The numbers in the figure include 'secondary moves,' which are relocations that followed a pre-existing relocation to another EU city. For example, while many firms relocated to Frankfurt as their main EU hub, they also expanded to Paris or Madrid in secondary moves.

Figure 3 shows that Dublin was the main destination of the Brexit-led financial relocation. Most of the relocation to Dublin, however, does not consist of banks, but the activities of asset management firms such as Goldman Sachs, Morgan Stanley or Aberdeen Standard. Thirty-seven percent of post-Brexit relocations to Dublin are asset management firms. Only fourteen percent are banks. The situation is the reverse for Frankfurt where thirty-

eight percent of relocations are banks and seven percent of asset management firms. This data may suggest a financial exodus and challenge the idea that London will remain resilient. But it is important to note that the 'number' of firms is not necessarily a proxy of the size of the relocation.

**Figure 3:** Number of firms moving from London to EU financial centers, by city
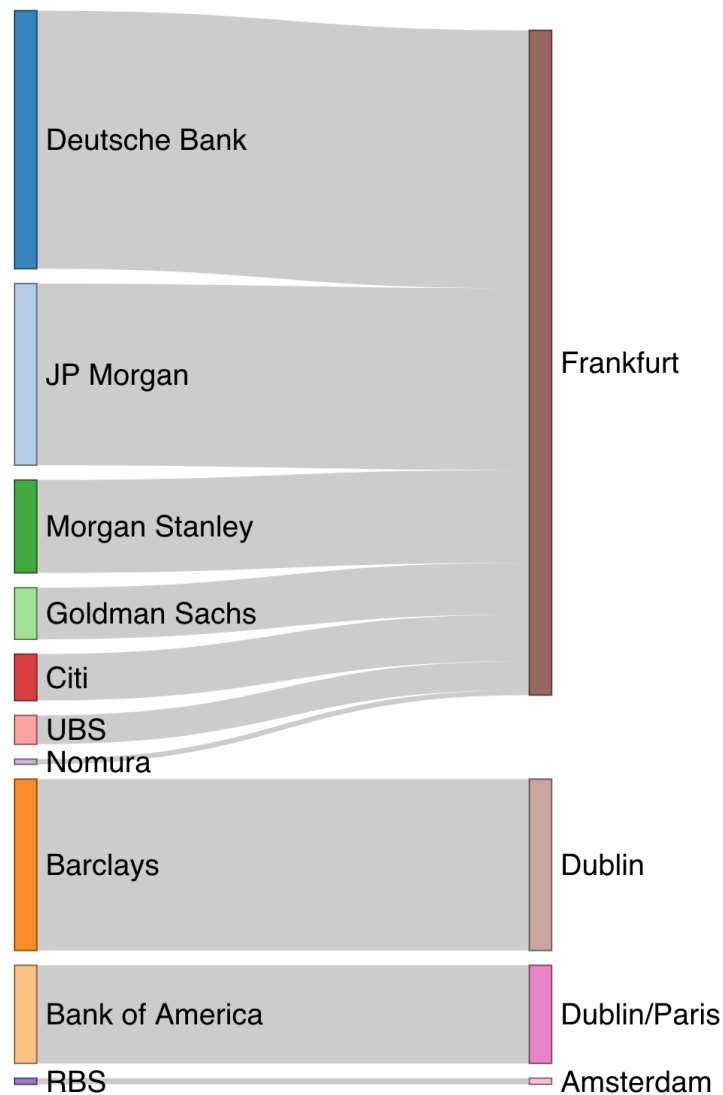


Source: Authors' elaboration based on data in Hamre and Wright (2021).

If we just look at the share of 'assets' relocated, Frankfurt occupies a prominent position. Figure four shows a Sankey diagram of the assets transferred by the ten largest banks from London to other EU financial centers. Out of the £900bn in assets depicted in the chart, £644bn shifted to Frankfurt, whereas the remaining £267bn was distributed between Dublin, Paris and Amsterdam. The largest shifts are represented by Deutsche Bank (£250bn), JP Morgan (£176bn), and Barclays (£166bn). In this regard, Frankfurt is the EU-based city that

has attracted the most *assets*, which is arguably the most important variable, given that it is the

assets that generate the income, and in turn, the size of the financial centre.

**Figure 4:** Assets moved from London to EU financial centers, selected banks, asset value in

billion GBP



Source: authors' elaboration based on data in Hamre and Wright (2021). Note: the size of the
grey areas represents the size of the flow in terms of assets (measured in billions of £).

*Growth Models and their Financial Centers*

The influence of financial centers on national growth models differs across the countries under analysis. To appreciate these differences, we look at the concentration of bank-level indicators in each city's financial center vis-a-vis its domestic economy. We extract bank-level data from Bank Focus (formerly known as Bankscope) from the Bureau van Dijk database. Our sample comprises data from financial institutions located in the United Kingdom, France, Germany, Ireland and the Netherlands. In order to observe changes in institutions depending on their geolocation, we keep only unconsolidated bank statements. For each financial institution, Bank Focus reports the city where the institution is located, allowing us to identify those that are located in financial centers and those that are not. Since our focus is on the private sector, we drop central banks and public development banks from the sample.

Our database has a total of 4,206 financial institutions for the years from 2004 to 2020. The largest share of institutions is located in Germany (51.68 percent), which is populated by a large number of small cooperative and savings banks. The second largest share is in the UK (22.75), followed by France (14.85), Ireland (5.46) and the Netherlands (5.27). The majority of institutions in the sample are non-life insurance companies (25.22 percent), cooperative banks (20.07), life insurance companies (14.64), savings banks (9.45), commercial banks (7.15) and investment banks (3.42).

The concentration of banks in financial centers varies considerably across countries. A straightforward indicator to see this is the distribution of observations across cities within the same country. London comprises 59.11 percent of all the observations for the UK. The second city in the UK with the highest share of observations is Edinburgh with 3.84 percent of UK's observations. Amsterdam covers 20.71 percent of the Dutch sample, followed by The Hague (9.84 percent). Frankfurt is the financial center with the lowest number of observations relative to the rest of its domestic financial sector. The German city, seat of the Deutsche Bundesbank

and of the European Central Bank, covers 5.28 percent of the German sample, which is very close to Hamburg (4.78 percent). The most extreme distribution is Ireland, where 92.53 percent of the observations are located in Dublin. The second Irish city in terms of observation is Kildare, which is a small town covering only 0.82 percent of the Irish sample.

We now investigate the concentration of bank assets in financial centers vis-à-vis the rest of the domestic economy. The distribution of assets provides us with information about the size of the financial sector in financial centers compared to the rest of the country. But a second aspect is credit, which is a crucial element of national growth models (Fuller 2015; Baccaro and Tober 2021) that does not necessarily go hand in hand with the distribution of financial assets. Analyzing banking at city-level allows us to observe more closely the role of cities in shaping national growth models. Specifically, understanding where bank loans originate in a country provides us with a deeper understanding of the role of financial centers within their domestic growth model.
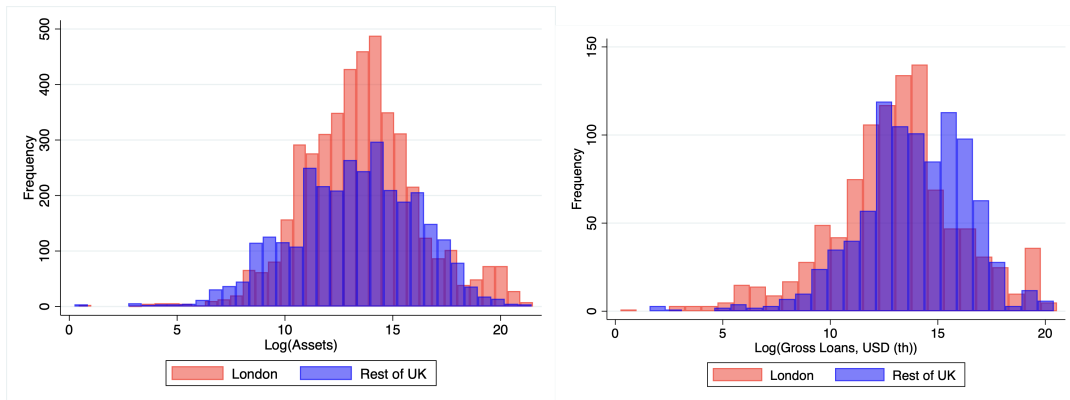
Figure 5.A displays the distribution of bank assets and loans in London and in the rest of the UK. The longer tail on the right side of the asset distribution of London indicates the concentration of larger institutions in the City compared to the rest of the country. On the contrary, the rest of the UK presents a longer tail on the left-hand side of the distribution, as smaller banks tend to be located outside of London. For example, the smallest commercial banks in terms of assets in the sample (including other countries) are located in British cities such as Leicester, York and Wythall. The distribution of loans is notably different. Loans in the rest of the UK are more negatively skewed than in London (Figure 5.A, right panel). This discrepancy indicates that, although assets are concentrated in London, a large share of loan issuance derives from banks located *outside* of the City.

Similar to London, the distribution of assets in Paris is negatively-skewed as larger banks are located in the capital city (Figure 5.B). However, the high frequency of assets in
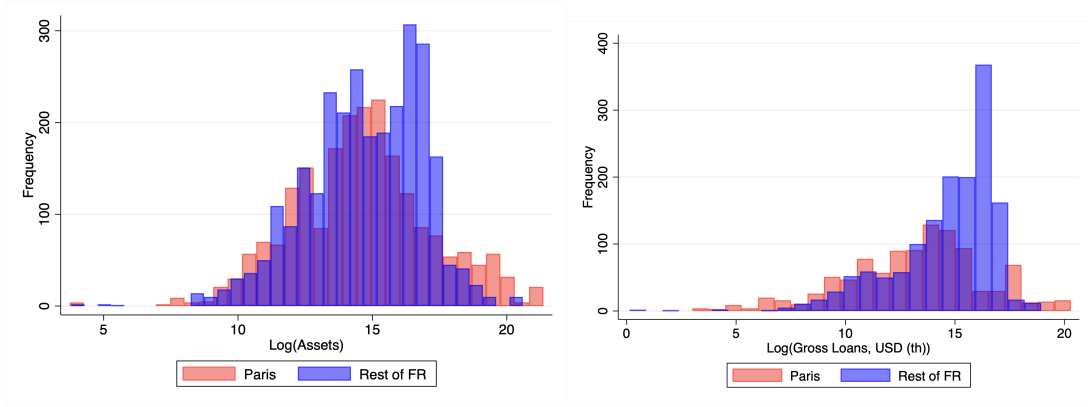
banks located outside Paris around the mean points to a more geographically balanced banking system. In other words, while large banks are located in Paris, average-sized banks are evenly distributed inside and outside Paris. France also displays a similar model to the UK in terms of credit insofar as the distribution of loans issued by banks outside Paris is negatively skewed, whereas the financial center presents a normal distribution. Overall, this suggests that France, similar to the UK, relies less on its financial center for the issuance of domestic bank loans, despite the comparatively high amount of assets concentrated in their financial. It should be noted, however, that both London and Paris show a peak in the end of their tail, indicating that very large loans (compared to the ones issued in the rest of the country) are issued more frequently in financial centers.

**Figure 5: Bank assets and loans in financial centers and in the rest of their countries**
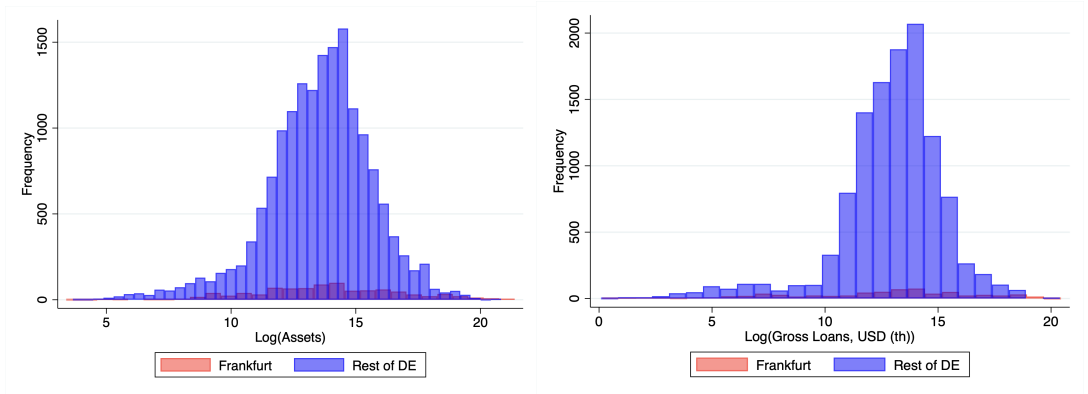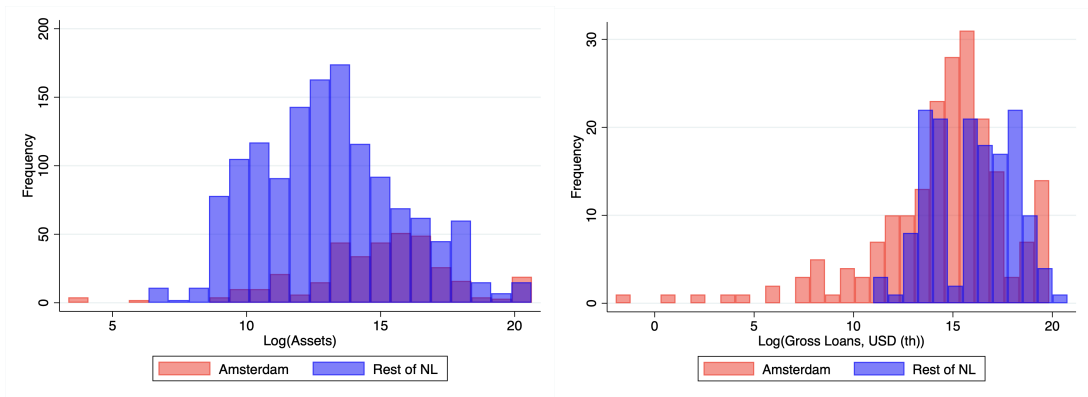
*A. London and the UK*
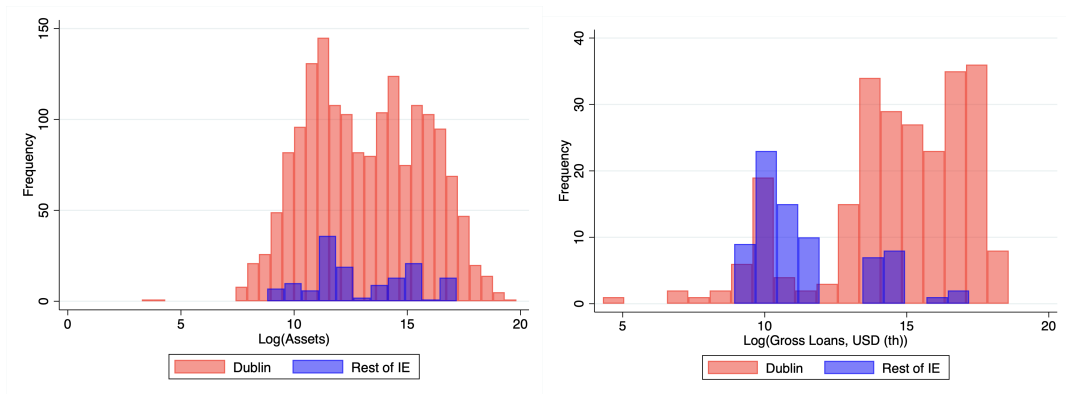
## B.  Paris and France



## C.  Frankfurt and Germany



## D.  Amsterdam and the Netherlands

*E. Dublin and Ireland*



The German model differs substantially from the first two. The constellation of small local cooperative and savings institutions that characterize the German banking sector is clearly visible in Figure 5.C. The histogram on the left of Figure 5.C shows that the great majority of banks are located outside Frankfurt. Still, the role of Frankfurt as a financial center is evident in the end tail of the asset distribution. This is not surprising as the largest banks in Germany, such as Deutsche Bank and Commerzbank AG, are located in Frankfurt. Nevertheless, the gap between Frankfurt and the rest of the country around the end of the distribution appears smaller in comparison with the other financial cities and their respective countries.

The distribution of gross loans in Germany is somewhat similar to the distribution of assets and seems to reflect the role of German banks as described in the Varieties of Capitalism literature (Hall and Soskice 2001; Rueda and Pontusson 2000; Hardie et al 2013; Deeg et al 2016; Feldmann 2019). In coordinated market economies, such as Germany, banks act as lenders and investors for the financing needs of domestic firms. This allows firms to access patient capital and engage in long-term investment strategies (Deeg 1999; Vitols 2001; Allen 2006). However, Braun and Deeg (2021) have recently noted that this model has evolved, redirecting bank lending to international borrowers, hence reducing the power and relevance of German banks over their domestic growth model.

The Dutch model displays a similar distribution of assets to the German model, but with a higher concentration of large banks in the financial center relative to the rest of the country (Figure 5.D). Amsterdam, like Frankfurt, hosts a number of institutions of different sizes, including some of the largest banks in the country, such as ING and ABN AMRO. This is reflected in the negatively-skewed distribution of assets in Amsterdam compared to the rest of the Netherlands. Nevertheless, the tails of both distributions show that large entities are not all concentrated in the financial center. For example, the second largest bank in the country, Rabobank, is based in Utrecht. The picture is different when we look at credit. On the one hand, large loans are issued by institutions located both inside and outside Amsterdam. On the other hand, small loans appear to be concentrated in banks located in the financial sector.

Ireland represents an opposite case to the German model as the Irish banking sector is dominated by its financial center (Figure 5.E). Most banks are concentrated in Dublin, leaving a very low amount of assets outside of the capital city. In addition, Dublin hosts the largest institutions in the country in terms of assets. The reliance of the Irish financial sector on the capital city is also reflected in the distribution of loans. Credit is mostly issued by institutions located in Dublin, regardless of the size of the loan. Based on this, it is fair to assume that the vast majority of finance-banking jobs are located in Dublin.

We now use the location of financial *assets and loans* in London, Paris, Amsterdam, Dublin and Frankfurt to create a two-dimensional model of European financial centers - summarized in Table 1. Frankfurt is the city that displays the lowest degree of concentration in terms of both assets and loans. While Frankfurt remains Germany's financial center, a relevant amount of assets and loans is located in different German cities, such as Munich, Berlin and Stuttgart, among others. On the other extreme, we have Ireland, which relies heavily on its financial centre. Assets and loans are highly concentrated in Dublin compared to the rest of the country. London, Paris and Amsterdam are located in a midway between these two extreme

cases. While financial assets in the UK and France tend to concentrate in the capital cities (even if to a lesser extent than in Ireland), banks outside London and Paris provide a relatively large amount of credit to the domestic economy. Amsterdam displays the opposite sign, insofar as Dutch institutions are located not only in the financial center, but also in cities such as Utrecht, the Hague and Rotterdam. While these cities contribute to the provision of credit, especially in the form of large loans, most lending is concentrated in the financial center.

Table 1: Four models of financial growth

|  |  | **Assets** | |
| --- | --- | --- | --- |
|  |  | *Low concentration in financial center* | *High concentration in financial center* |
| **Loans** | *Low concentration in financial center* | Frankfurt | London<br>Paris |
|  | *High concentration in financial center* | Amsterdam | Dublin |

*Empirical Specification*

In line with our expectations regarding place-specific social capital and professional linked-ecologies, our aim in this section is to understand whether financial institutions in London and in the rest of the UK experienced a change in assets and loans before and after Brexit. Building upon this, we explore whether the other EU financial centers analyzed above reacted similarly compared to London, and to the rest of their economies.

We examine the impact of Brexit on a number of bank-level variables (assets, loans, number of employees and derivatives) by comparing banks located in Europe's financial centers with banks located in the same country but outside those centers. To this end we use a hierarchical linear model (HLM) and combine it with a difference in differences approach.

There are a number of advantages of HLMs over traditional fixed effect regressions. First, as banks are nested in cities, which are nested in countries, observations might not be independent (as assumed in traditional OLS) but may rather be affected by their membership in these groups. For example, the lending behavior of a bank could vary depending on whether the bank is in a financial centre, or depending on the country's financial regulation and supervision. Hence, in contrast to traditional panel data regressions, hierarchical linear models do not assume observations to be independent but take into account the multilevel structure of the data by estimating an intercept and a slope for each group (e.g. for each city). For this reason, HLMs have been extensively applied to banking data (Mourouzidou-Damsta et al. 2019; Doumpos et al. 2015; Li et al. 2013; Kayo and Kimura 2011).

Moreover, since HLMs decompose the variance attributable to banks and cities, they model the conditional mean of the dependent variable to vary at different group-levels. This allows us to compare the estimates of banks located in different regulatory environments. Another advantage is that, by including group-level random effects, HLM controls for the mean across that group. This feature is particularly helpful when subsamples have different sizes, as in our case, where the number of banks in the UK is substantially higher than the number of banks located in Ireland. Formally, we estimate the following equation for each bank $i$ located in city $c$ and country $j$ at time $t$:

$$Y_{icjt} = \alpha + \beta Brexit_t + \gamma D^{\pi}_{icjt} + \lambda(Brexit_t \times D_{icjt}) + X'_{icjt}\phi + \mu_t + \theta_j + \tau_c + \psi_{ic} + \varepsilon_{icjt}$$

$D$ is a dummy that equals 1 if bank $i$ is located in a financial centre $\pi$, where $\pi = \{London, Frankfurt, Paris, Dublin, Amsterdam\}$. $Brexit$ is a dummy that equals 1 for the years from 2016 (the year of the Brexit referendum) onwards, and 0 otherwise. Our coefficient

of interest is $\lambda$, which captures the variation in $Y$ in financial centers *after* Brexit. As in standard difference-in-differences models,

$$\lambda = E[Y_{icjt}|D_{icjt} = 1, Brexit_t = 1] - E[Y_{icjt}|D_{icjt} = 1, Brexit_t = 0].$$

Our set of dependent variables, $Y_{icjt}$, includes bank assets, loan growth, number of employees and derivatives. Following the literature on banking, we measure assets as the natural logarithm of bank assets, which are reported in thousands of US dollars. Based on Micco and Panizza (2006), we measure loan growth by computing the log-difference of the raw data on gross loans, which are also reported in thousands of US dollars. Formally, we compute the following: $LoanGrowth \equiv ln(Loans_t) - ln(Loans_{t-1})$.

The random variables $\tau_c$ and $\psi_{ic}$ allow the intercept ($\alpha + \tau_c + \psi_{ic}$) to be unique and random for each bank and city. We control for year- and country-specific characteristics, which are captured respectively by $\mu_t$ and $\theta_j$. $X$ is a vector of bank-level controls. In particular, depending on the dependent variable, we control for bank assets, lending (measured with loan growth), number of employees, solvency (measured as the share of equity over assets), net income, and efficiency (measured with the cost-to-income ratio). While we include the total amount of derivatives as a dependent variable, we do not include it as a control due to the high number of missing values.

*Results*

The results of the hierarchical linear model are presented in Table 2. Each column displays the estimates of the baseline specification with a different dependent variable. For each specification we include the set of bank-level controls described in the previous section alongside country and year fixed effects.

The first column shows the estimates for bank assets, measured as the natural logarithm of total assets. The coefficient of Brexit as a standalone variable is given by: $E[Y_{icjt}|D_{icjt} = 0, Brexit_t = 1] - E[Y_{icjt}|D_{icjt} = 0, Brexit_t = 0]$. This means that the coefficient for Brexit measures the change in bank assets after Brexit for those banks located outside financial centers. The positive and significant coefficient indicates that after Brexit bank assets outside financial centers increased. The coefficient for London indicates the pre-Brexit difference between London and the rest of the UK in terms of bank assets. The same holds for the other financial centers. We note that pre-Brexit bank assets were significantly higher in all financial centers. This gap is however less marked for Frankfurt and Pari. The former displays a coefficient significant at the 10 percent level, whereas the latter displays a non-significant coefficient.

The most interesting coefficient is the one denoting the interaction between Brexit, London, and other EU-based financial centers. The sign of the coefficient indicates that assets declined in banks located in financial centers after 2016. Interestingly, this result does not concern London solely, but extends to the other financial centers. This estimate likely points to an overall decline of bank assets, which affected all countries in the sample. Frankfurt is the only city where this association is not significant. The result for Frankfurt might be explained by the high inflow of bank assets from London depicted in Fig. 4, which could have compensated for the general post-Brexit decline in bank assets for Frankfurt.

Bank loans display similar results to bank assets, but in a somewhat more differentiated way across cities (Column 2). After Brexit, loans declined significantly in London (of 14 percent) and Amsterdam (of 23 percent). The drop in loans in London is in line with evidence in Berg et al. (2021), who show that Brexit caused a decrease in the issuance of syndicated loans. As they highlight in the paper, the decline in syndicated loans stems from a reduction in demand from *UK firms*, and not from cross-border lending. It is therefore likely that the decline

in lending observed in our estimates reflects the same fall in the *domestic demand* for bank loans in the UK.

Column 3 shows the results for the growth in the number of employees per bank. After Brexit, *all financial centers*, including London, experienced an *increase* in the number of individuals employed in banks. However, the magnitude of this growth differed across cities. Employees in London increased by 6 percent. Banks located in Frankfurt and Paris experienced a similar increase, with a growth rate of 5 and 4 percent respectively. Amsterdam experienced almost double the growth of London, with an increase of 11 percentage points post-Brexit, while Dublin outperforms other cities with a growth of 37.4 percent.

The results on derivatives, displayed in Column 4, rely on a smaller number of observations due to the high number of missing values. The coefficient for London post-Brexit is not significant, indicating that no significant change has taken place since the referendum. This result can be explained by the current context of the Brexit negotiations. Since moving euro-denominated derivatives clearing from London to the EU would destabilize the financial sector, negotiators agreed on an extension for derivatives clearing houses in London to continue clearing derivatives for their EU customers until mid-2022 (Reuters 2021). Despite this arrangement, we observe a significant post-Brexit growth of derivatives in banks located in Amsterdam and Dublin.

**Table 2: Hierarchical Linear Model Panel Estimates**

|  | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variables: | Assets | Loan growth | log(Employees) | Derivatives |
| Brexit | 0.875*** | 0.173 | 0.224** | 0.770 |
|  | (0.088) | (0.178) | (0.099) | (0.919) |
| London | 0.730** | 0.075** | -0.749*** | 0.538 |
|  | (0.339) | (0.031) | (0.133) | (0.442) |
| Brexit × London | -0.046** | -0.141*** | 0.060*** | 0.252 |
|  | (0.018) | (0.035) | (0.021) | (0.199) |
| Paris | 0.283 | 0.010 | -0.771*** | -2.960** |
|  | (0.238) | (0.027) | (0.109) | (1.323) |
| Brexit × Paris | -0.038** | -0.013 | 0.043** | -0.985 |
|  | (0.016) | (0.033) | (0.018) | (0.619) |
| Amsterdam | 1.131** | 0.061 | -1.389*** | 0.038 |
|  | (0.552) | (0.076) | (0.325) | (0.937) |
| Brexit × Amsterdam | -0.228*** | -0.233*** | 0.107** | 0.784** |
|  | (0.041) | (0.077) | (0.046) | (0.314) |

| | | | | |
|---|---|---|---|---|
| Dublin | 2.675*** | -0.117 | -1.453*** | 0.370 |
| | (0.513) | (0.084) | (0.336) | (1.651) |
| Brexit × Dublin | -0.343*** | -0.024 | 0.374*** | 0.587** |
| | (0.039) | (0.071) | (0.044) | (0.281) |
| Frankfurt | 0.467* | 0.063** | -0.209** | 2.458*** |
| | (0.273) | (0.028) | (0.104) | (0.698) |
| Brexit × Frankfurt | -0.029 | 0.015 | 0.053** | 0.104 |
| | (0.019) | (0.038) | (0.022) | (0.341) |
| | | | | |
| Constant | 10.986*** | 0.108 | -3.155*** | -16.066*** |
| | (0.098) | (0.179) | (0.137) | (1.493) |
| | | | | |
| Observations | 13,369 | 13,369 | 13,369 | 1,247 |
| Number of groups | 1,214 | 1,214 | 1,214 | 95 |
| Year FE | YES | YES | YES | YES |
| Country FE | YES | YES | YES | YES |
| Controls | YES | YES | YES | YES |

Notes:

*p<.05; **p<.01; ***p<.001

*Discussion*

Our findings show that London has not, so far, experienced a drop in bank assets different from other financial centers, with the exception of Frankfurt, whose bank assets remained unaffected after Brexit. Similarly, the fall in bank lending experienced by London does not differ substantially from the one experienced by Amsterdam. The growth in the number of employees in financial institutions was positive both in London and all EU-based financial centers, suggesting that there has not been a massive relocation of employees from London to other EU-based cities. However, it should also be noted that the growth of employees in Dublin is significantly larger than in every other financial center. Finally, derivatives remain unaffected by Brexit, probably as a consequence of the current negotiations. The only exceptions are Amsterdam and Frankfurt, where derivatives grew.

As such, while we may observe a (slight) contraction in the UK's financial sector, this may not necessarily translate into an exodus from London to other EU financial centers. Rather, the effect may be more observable in other English cities. As we expected, the evidence presented suggests that the London-based UK growth model has, for the moment, remained largely unaffected by the Brexit referendum. The ties shaping the London-centered UK growth model are binding, even if the process appears somewhat more fragmented in the rest of England. This does not imply that the growth models of other EU countries will remain unchanged, or that Brexit will have no longer-term effects on London and the UK. It may be that, as once erroneously noted about the French revolution, it is just too soon to tell. Importantly however, our estimates suggest that financial centers across the EU have responded differently to the Brexit shock depending on their city GM conditions the overall *domestic* growth model, and the sub-sectors of finance that they specialize in.

Frankfurt has been less affected than other cities, probably because of a more equal distribution of bank assets and lending across other German cities. Germany is, in turn, less

reliant on Frankfurt for its domestic growth compared to other countries. Amsterdam and Paris seem to share a more similar path to London. They have a large concentration of assets and loans in their financial centers. Finally, Dublin is the city where the first signs of a "Brexit reaction" are much more visible. Dublin has benefited from the relocation of asset management firms out of London. The determinants of this are perhaps related to the fact that Ireland has an English speaking common-law legal system and because Dublin acts as an adjunct of London as much as it does its own financial centre in areas such as asset management. The question remains as to whether this windfall proves to be a net-positive to the Irish GM.

*Conclusion*

What does all this mean for our understanding of the GM research program in comparative and international political economy? We think there are two key takeaways. First, in terms of scale effects, the role of 'city-states' in shaping national growth models clearly varies between countries. The financial centers of Dublin, Paris and London are key nodes in production of the gross value added of their countries national GDP. In these countries, the national growth model is *amplified downwards* through the capital city, which has important implications for the wider politics of distribution within these countries (Bradley et al 2011). Large parts of their domestic political economy depend upon, and lives-off, the transfers and resources generated in the city. This intra-regional inequality is likely to feed into the economic geography of discontent and manifest itself at the ballot box (Broz et al 2021). This dependence on the 'city' is much less obvious in Germany and the Netherlands, where bank loans and financial assets are much more widely spread across regions and cities. This would suggest that unlike France and the UK, the Dutch and German growth models are much less dependent on what happens in their key financial centers - Frankfurt and Amsterdam. This raises interesting

political and economic geography questions that would benefit from being integrated into the GM research program.

Second, although it is still too early to make a definitive conclusion, the fact that the shock of Brexit has not significantly affected employment in London-based finance would suggest that global financial centers do not move easily. This is in line with theories of place-specific social capital and professional linked-ecologies. Rather than seeing London, Dublin, Amsterdam, Paris and Frankfurt in competition, therefore, it may be better to conceptualize them as complementary city-nodes in a global wealth chain (GWC  ), which basically service different parts and sub-sectors of global finance (Seabrooke and Wigan 2014; 2017). These are the 'ties that bind' London in place, but also blind us insofar as our ontological bias toward national-level growth models discourage us to view networks of financial cities as a GM type in its own right.

This perspective is complementary to the economic geography argument of Iversen and Soskice (2019), who argue that the future of capitalist democracy is likely to be determined by high-tech and high-growth growth cities, and in particular, the cluster effect of high-skilled graduates that these cities tend to generate. Based on this observation, Elkjær & Iversen (2020) argue that capitalist democracy is stable because an aspiring urban middle class of graduate's vote for liberal-centrist governments to defend their economic interests.

We could, however, use this analysis to draw a rather opposite conclusion - namely, that because growth is so concentrated in highly financialized urban high-tech cities, the intra-regional winner/loser dynamic that this generates within countries is likely to create a *destabilizing* effect (see also Le Gales and Pierson 2019). The cases of the Netherlands and Germany, however, suggest perhaps a third outcome. That countries with a more geographically even dispersal of positive GVA components may not need to follow the 'winner takes all' logic of core cities driving the politics of growth. Future GM research within the

study of comparative political economy would benefit from analyzing these political geographic dynamics and distributive conflicts much more closely.

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